PAPER TRADE JOURNAL

OCTOBER 30, 1961

High-Velocity Drying Gets Big Play at Engineer's Conference

At Cosmopolis, Two-Stage Cooking Produces Premium Sulphite Pulps

Dierk's Insulating Board Machine Has A Number of Unique Devices

How You Can Automatically—And Positively — Control Size Makeup

Contents of the Week, pages 4-5

Xerox University Microfilms, Inc.
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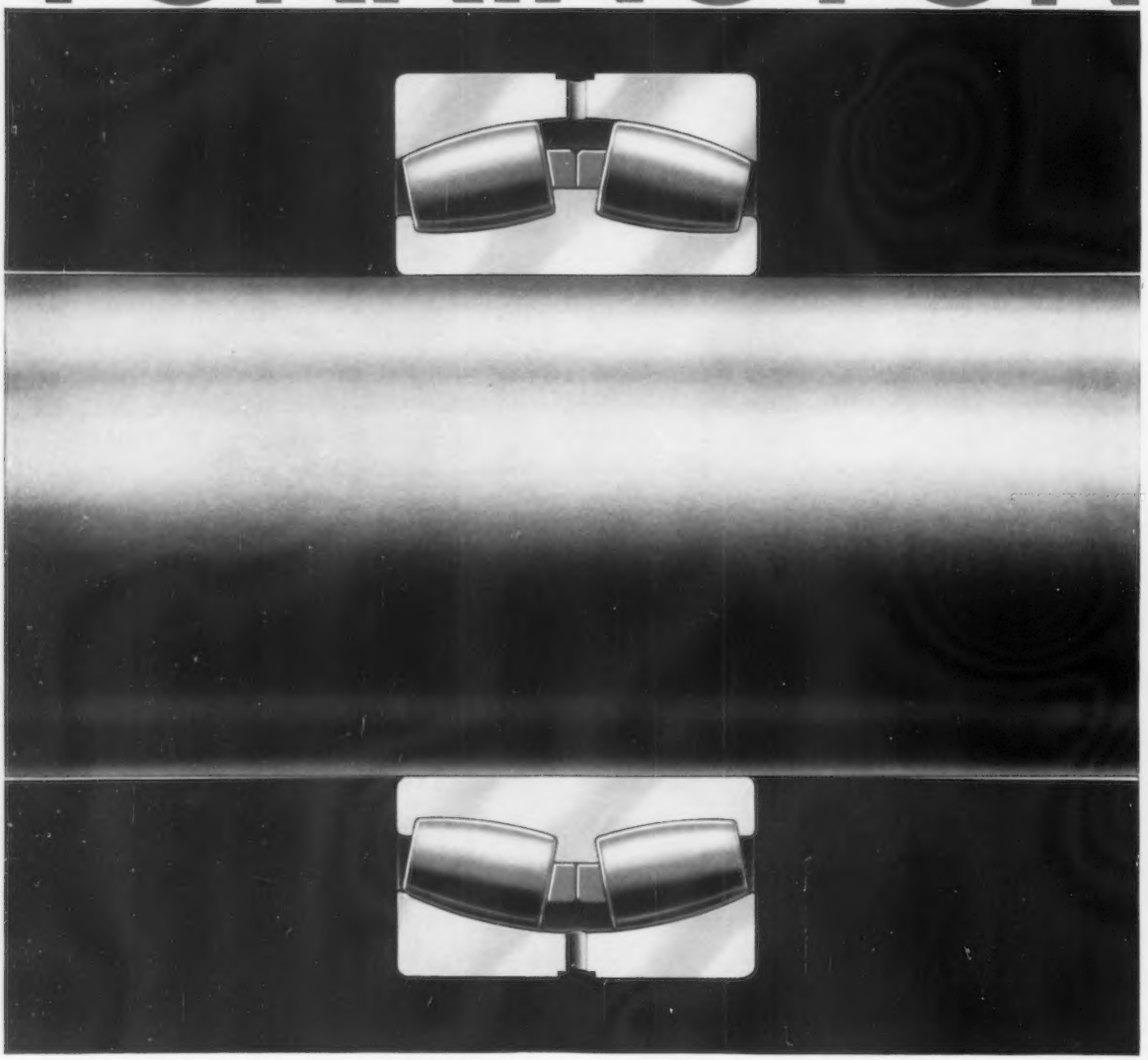
... without leaving the Sandoz Paper Laboratory, he works for a hundred mills

Paper coloring is the work of a specialist who knows the chemistry of dyes and pigments, and the chemistry of paper processes. Because many problems flow into the Sandoz paper laboratory, colorists there have the broad experience as well as the limitless color inventory needed to prepare a better formulation for your colored grades. See Sandoz about color. SANDOZ, INC., 61 Van Dam St., New York 13, N. Y. ALgonquin 5-1700. Offices: Appleton, Wis.; Charlotte 5, N. C.; Cincinnati 26, O.; Fair Lawn, N. J.; Hudson, Mass.; Los Angeles, Cal.; Philadelphia, Pa.; Portland 14, Ore.

TORRINGTON



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Full bearing capacity with 3° total misalignment...is an outstanding feature of Torrington Spherical Roller Bearings.

Spherical design compensates *within the bearing* for both static and dynamic misalignment...offers design engineers wide latitude plus considerable savings in production costs.

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Torrington Spherical Roller Bearings stand up when other bearings give up. They're backed by Torrington experience in making every basic type of anti-friction bearing. Buy the best...specify Torrington.

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offer these features:

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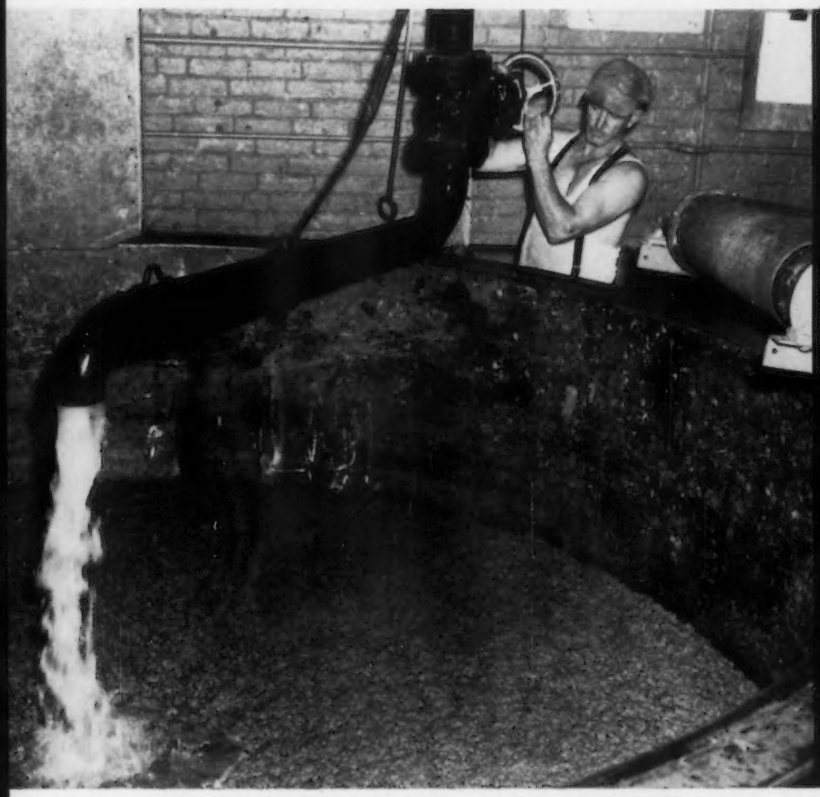
THE TORRINGTON COMPANY

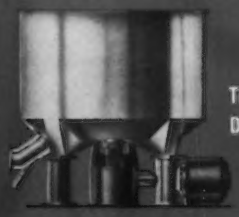
TORRINGTON BEARINGS

South Bend 21, Indiana • Torrington, Connecticut

"The Emerson Dualator does the best defibering job of any equipment we know about"

says **David W. Peat**, Manager of Manufacturing of the Gilman Paper Company, Gilman, Vermont.





The Emerson Dualator

. . . employs contra-rotating rotors which form a cylindrical zone of positive defibering action

. . . and develops a distinctive radial stock flow.

NEW EMERSON DUALATOR REDUCES DEFIBERING TIME AND ENERGY INPUT AT GILMAN

"Following our search for a pulper that could defiber hard-sized and wet strength broke effectively with minimum use of heat and chemicals," continued Mr. Peat, "we chose the Emerson Dualator. A full year of continuous operation proves it does the job better and faster than previous methods with far less power per ton of throughput."

Small wonder at Gilman's enthusiasm! Based upon an entirely new defibering concept, the Dualator is the most advanced pulper ever developed.

Utilizing two bottom rotors operating in opposite directions on the same axis, a cylindrically shaped defibering zone is defined by the narrow clearance between the inner and outer rotor vanes. Stock is directed from the inner rotor into the path of the outer rotor vanes. This abrupt reversal in direction, at an interfacial speed of 6,000 fpm, produces tremendous hydraulic shear forces that literally rip the stock to shreds, with no sacrifice in fiber length.

The revolutionary design of the new Emerson Dualator reduces the defibering time and energy input of conventional pulpers by at least one half. With contra-rotating rotors, energy is converted to productive pulping. None is wasted in needless circulation. This means more tons/day of complete, efficient defibering. It permits the use of smaller tubs and, in many instances, reduces or eliminates the necessity of using chemicals and/or heat. A distinctive radial flow pattern develops from the interaction of the two rotors, which permits operation at as little as 25% of tub capacity with no splashing.

Your mill can benefit from owning an Emerson Dualator as has the Gilman Paper Company. For complete information, write The Emerson Manufacturing Co., Division of John W. Bolton & Sons, Inc., Lawrence, Massachusetts.

BOLTON EMERSON
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PAPER TRADE JOURNAL

PUBLISHED WEEKLY SINCE 1872

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Week of October 30, 1961
Vol. 145, No. 44

FEATURED THIS WEEK

The First Two-Stage Premium Sulphite Pulps in North America

Paper Trade Journal is privileged to reveal in this on-the-spot report the first details of Weyerhaeuser's two new magnesium base sulphite pulps and how they are made—Harry Dyer **20**

Engineers Dissect High Velocity Dryers at Conference

Via technical papers and a panel session on high velocity dryers for coating, many interesting points on operation and problems with this often misunderstood equipment were brought out—John C. W. Evans, Paul D. Van Derveer **26**

Automation Gives Size Preparation Flexibility With Positive Control

What are the design considerations and controls necessary to maintain quality and uniformity in today's size preparation system? An expert in this field provides detailed recommendations—William G. Farin **34**

New Mill Marks Dierks' Entry Into Insulating Board Field

The mill features a specially designed fourdrinier wet end which allows the headbox and breast roll to be precisely raised or lowered. It is said to permit production of a wide range of board thicknesses. **38**

SUBSCRIPTIONS →

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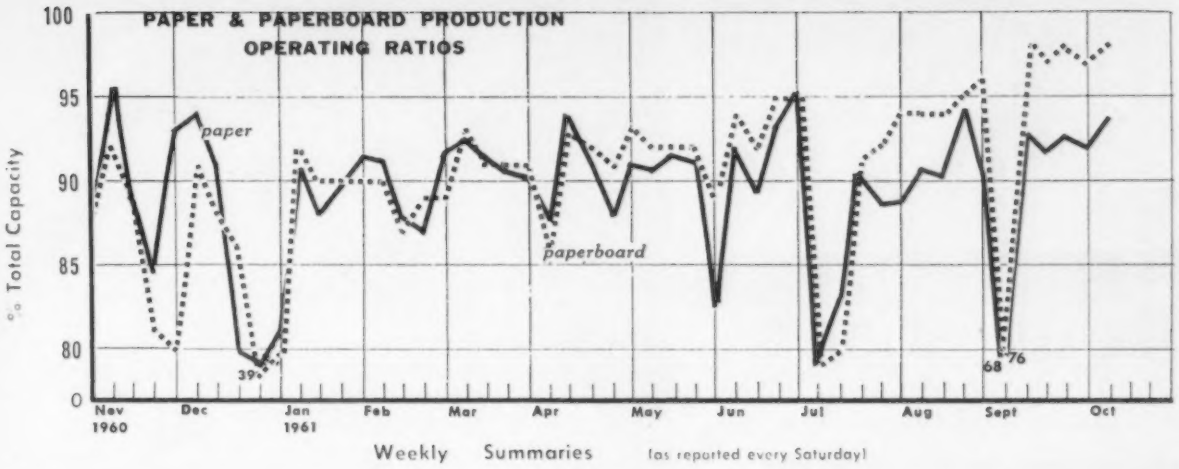

NEWS OF THE WEEK

Doeskin Shareholders Group Opposes Sale to U.B.C. . . . Hercules Planning Multi-Million Dollar Tall Oil Fractionating Plant . . . Three Month Old Finch, Pruyn Strike Settled . . . First Paper Mill for Indonesia Announced . . . . . .

Champion Names Ohio Division Manager . . . Steiner Fills Executive Posts . . . PCA Names Special Kraft Products Salesman . . . Alberta West Names Olmstead a Director . . . Abitibi P&P Announces Senior Management Changes . .

Folder-Gluer-Stitcher Sets-Up For One-Man Operation . . . Vinyl Emulsion For Flexible Coatings . . . Electrohydraulic Servo Controlled Pumps . . . Epoxy Compound Repairs Cracked Concrete Surfaces . . . High Capacity Steam Generator Occupies Only 29 cu. ft. . . . . . .

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REMEMBER THESE DATES

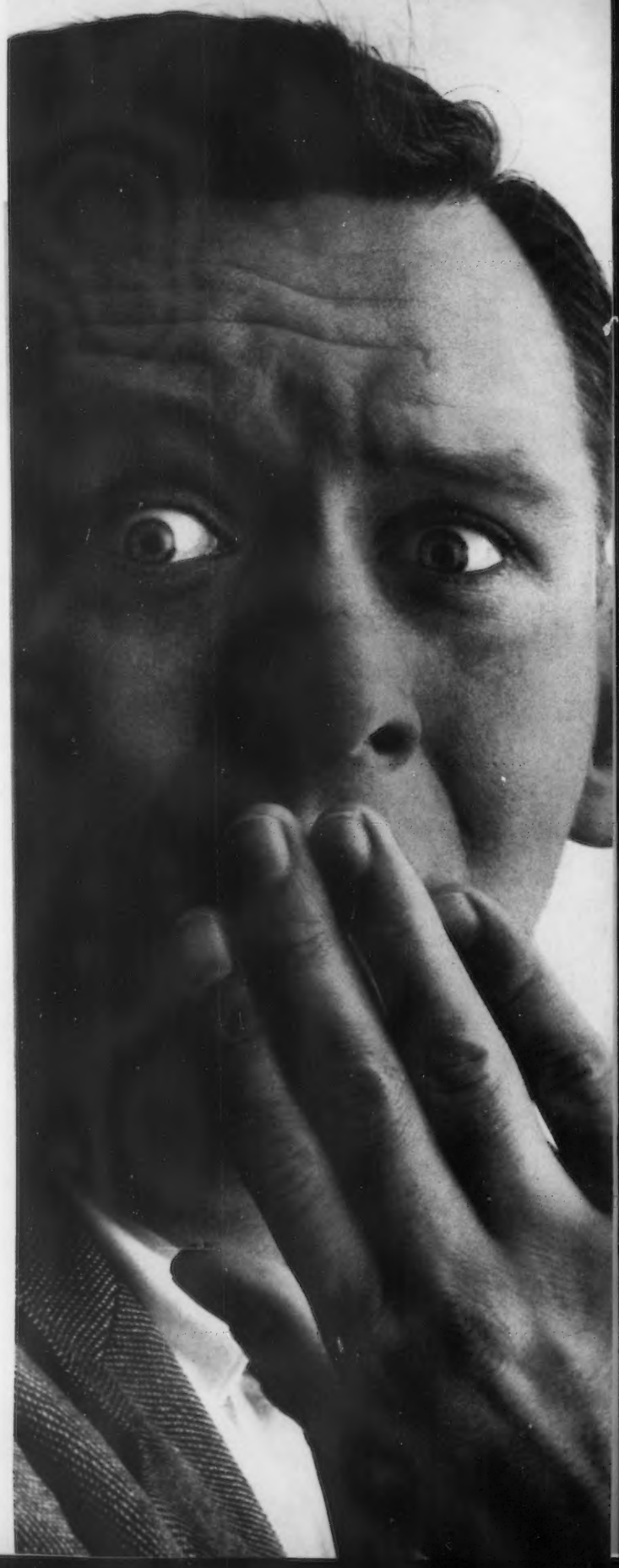
Alkaline Pulping Conference, Rice Hotel, Houston, Texas	NOVEMBER 1-3
CPPA Technical Section, Annual Meeting, Queen Elizabeth Hotel, Montreal, Canada	JANUARY 22-26
Paper Week, New York City	FEBRUARY 19-22

Six questions
to

embarrass

any
compression
strapping
machine
salesman

(except ours)



1 **How big is the press?**
The effective upper platen width on the Acme Steel E50 Strapping Press is a full 76″. And there's a full 65″ front to back in the lower platen.

2 **How many ways can I feed straps?**
Acme Steel designed the E50 for feeding front to back by power and/or hand. One or more powered strap feed units and tracks can be placed at predetermined locations. Or, you can hand feed to apply strap on a 4″ cleat at any location.

3 **Can I run flat bottom units, double faced pallets and narrow skids into and through your machine?**
The E50 Strapping Press permits unobstructed flow of all type units. It even handles small skids with space as little as 16″ between runners.

4 **What height skids will your machine handle?**
The E50 has a full platen opening for skids 30″ to 86″ high. What's more, the standard upper platen grid provides proper pressure on narrow cleats and close spacings in both directions.

5 **Can I strap in any pattern?**
The Acme Steel feed system and construction of the upper platen gives you maximum flexibility. You can place straps in both directions for all size skids.

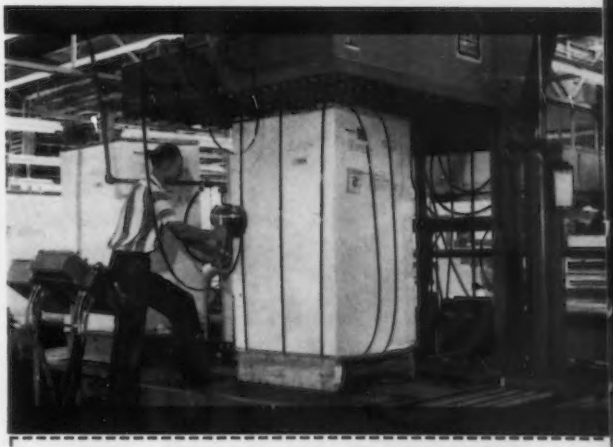
6 **How do I properly align conveyorized skids to power feed strap through notches in runners?**
The Acme Steel system for conveyorized wrapping and compression strapping skids of paper utilizes a special inexpensive conveyor. It positions the skid so strap can be power fed quickly and smoothly.

Get all the frustrating facts!

Call your Acme Idea Man, or return the coupon, for full details on the Acme Steel E50 conveyorized wrapping and compression strapping station. It's made by the people who pioneered and perfected compression strapping for the paper products industry. It's the machine that incorporates the experience of over 200 successful installations throughout industry—all Acme Steel, of course.

ACME STEEL

IDEA LEADER IN
STRAPPING



Acme Steel Products Division, ACME STEEL COMPANY
Dept. PJS-101, 135th Street & Perry Avenue, Chicago 27

☐ Please send full details on the features that have made the E50 Strapping Press the most successful wrapping and compression strapping machine in the field.
☐ Have Acme Idea Man call.

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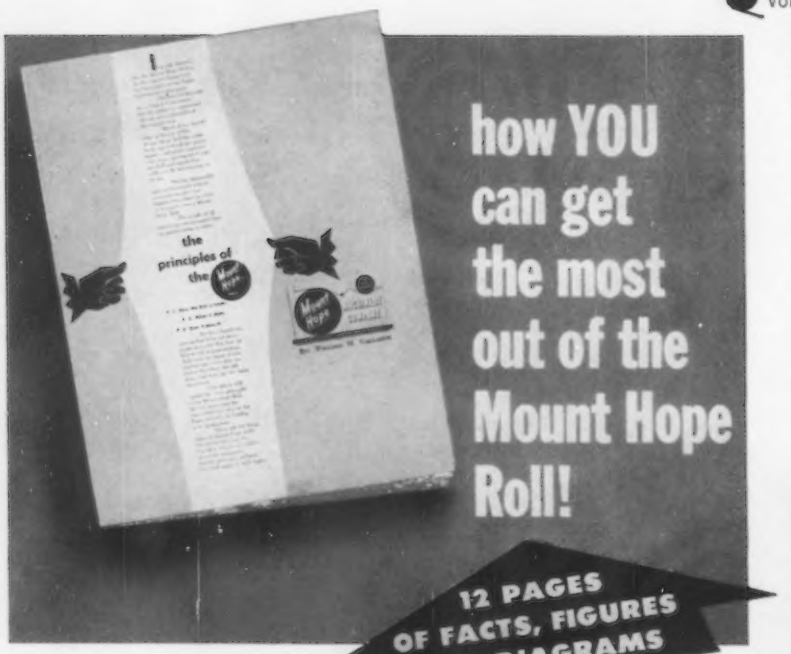
FACTS, FIGURES AND IDEAS DESIGNED TO Mount Hope SAVE YOU TIME AND MONEY

web control NEWS

Volume 1, Number 3



PREPARED WITH YOU IN MIND... WRITE FOR YOUR COPIES TODAY

"The Principles of the Mount Hope Roll," a 12-page dissertation on how to get best operating results from Mount Hope Rolls in paper mills and converting plants, now is available from Mount Hope Machinery Company, Taunton, Mass. The liberally-illustrated (25 drawings and photos) "how-to" booklet was designed to serve as an easily-understood operating manual.

The information was compiled and written by William Gallahue, Mount Hope's General Sales Manager.

It was prepared to answer numerous requests for reprints after the information was delivered as a slide-film talk before the Superintendent's Association of the Pulp and Paper Industry. Send for your copies today on your Company Letterhead or write your name, company and address on this ad and mail it to us. Do it now to be sure of your copy before our supply runs out.

Web Viewer Stops Motion, Shows Every Inch of Length and Width of Web

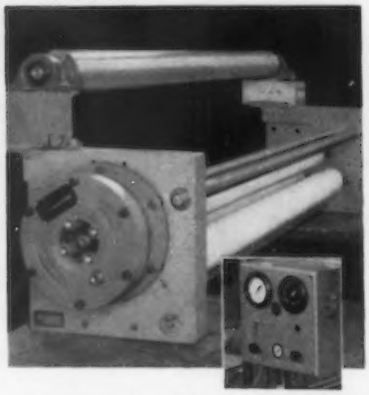
Now with Mount Hope's remarkable new Barr & Stroud WEB VIEWER you need not stop your press to check register, and:

There is no need to move the unit, yet entire pattern is seen actual size and color; the viewer is compact (portable model available, too), can be installed on vertical, horizontal or angular run, and web can be viewed from any angle; no additional light is required (unless web area is dark); three inexpensive drives are available—Synchronous; Variable Speed; and Mechanical (when explosion proof electrical requirements must be met).

New Light Duty Packaged Designs in Winding and Unwind Equipment Provide Manual or Automatic Tension Control and Edge Guiding

We are pleased to announce the following basic line of Mount Hope Wind and Unwind Stands and Tension Control and Edge Control equipment:

1. Basic stand with manual letoff brake.
2. Basic stand with floating carriage base.
3. Basic stand with automatic tension control.
4. Basic stand with both floating carriage base and automatic tension control.
5. Wide range of safety chuck capacities and stand dimensions for various roll weights and diameters including selections of manual and air actuated brakes, air-cooled and water-cooled.



As always, Your Mount Hope Engineer can recommend just the right equipment for your specific requirements. And, if you desire, a demonstration can be arranged with your material in the Mount Hope Demonstration Room in Taunton.

If you have any web control problem, let us help you with it. You'll find out why so many papermakers and converters like doing business with Mount Hope.

MOUNT HOPE MACHINERY COMPANY
15 FIFTH STREET, TAUNTON, MASS.
Plants: Taunton, Charlotte and in England.
Sales Engineers in Principal Cities.
World Wide Distributors: Mount Hope Machinery S.A., Lausanne, Switzerland.

Mount Hope Makes the Following Web Control Equipment for Papermakers and Converters:

- Mount Hope Rolls
- Vari-Bow Rolls
- Felt Preservers
- Tension Controls
- Floating Roll Guides
- Swinging Roll Guides
- Floating Carriage Guides
- Web Viewer
- Precision Guiders
- Light Duty Wind & Unwind Stands

The following are Registered Trade Marks: Mount Hope; Vari-Bow.

Mount Hope MACHINERY COMPANY — Web Control Equipment — 15 FIFTH STREET, TAUNTON, MASSACHUSETTS

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For more information on the products mentioned above or on any felt or paper handling problem, contact Mount Hope or check the Reader Service Card. Please write in on the card the product(s) you are interested in.

Trends

Conference Features Many New Developments

Highlights of the Engineering Conference reported in this issue were the papers and discussion on high velocity drying, continuous digesters and new developments in the use and application of Formex fabrics. Of significance is the general impression that we are still much in the dark on the correct location and operation of high velocity air dryers in spite of the fact that six companies are offering these units with a considerable number in operation.

N. A. Newsprint Off In September but U. S. Up

Production of newsprint in North America during September was 2.4% below that in September 1960. According to the Newsprint Service Bureau, output in the United States surpassed that of any September on record, and comparison with September 1960 showed a gain of 3.1%. Production in Canada was 4.0% below the year-ago level. Production in North America in the first nine months of 1961 was 1% above the level attained in 1960. Output of United States mills through the end of September was 3.7% more than the volume produced in 1960. Canadian production was 0.1% above that in the comparable period of 1960.

N. Y. Waste Paper Market in Flux

Recent waste paper price increases in the New York area have produced increased supplies of the coarser grades. This has resulted in a drop in prices for a few grades with the price picture in this area in a state of flux at press time. The higher grades are still in short supply with prices firm.

Turcotte Says Pulp Picture Improving

Wood pulp is participating in the current advance in the nation's industrial activity says Lawson Turcotte, president, Puget Sound Pulp & Timber Co. Clearly defined upward trends in production and use—reversing the pattern of a year ago—have brought the industry's tonnages to their all-time highs. "Gains to date in pulp production and use are less than the historical average growth of the industry," Mr. Turcotte observed. "No doubt the historical average growth rate of 3 to 5% a year will be regained. But meanwhile the industry is still at grips with two major problems: excess capacity, and sales prices too low for current manufacturing costs."

Further Developments in Sulphite Pulping

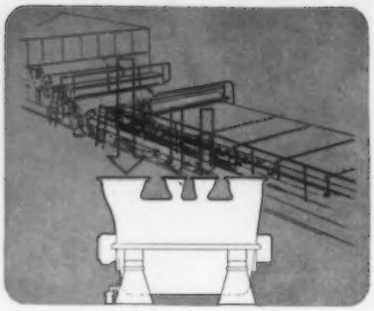
Several times in recent years we have had occasion to point out the resurgence of interest in sulphite pulping as the result of a number of technological developments. This week's issue carries the first report published anywhere of two new developments in sulphite pulping at Weyerhaeuser's Cosmopolis mill. Further proof that sulphite is not dead.

A Short Picture Story about the

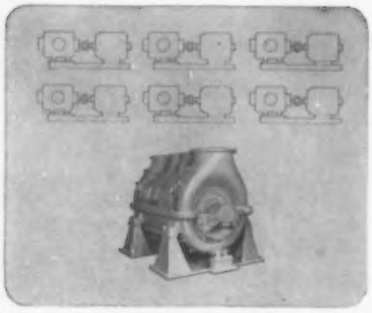
BIG NEWS

in Paper Making

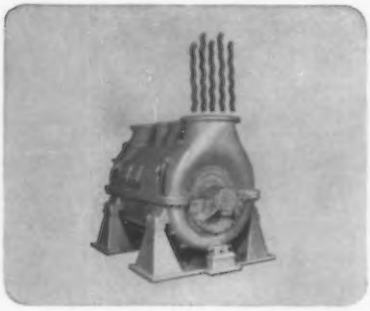
1. It's the Ingersoll-Rand Central Vacuum System for paper mills — a new application for centrifugal exhausters that opens a new era for the American paper industry because . . .



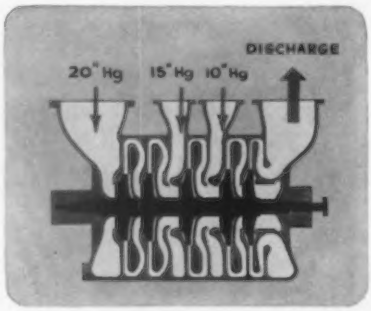
2. this one unit, with associated separators and controls, constitutes a complete system that meets all vacuum requirements for an entire paper-making machine. For example . . .



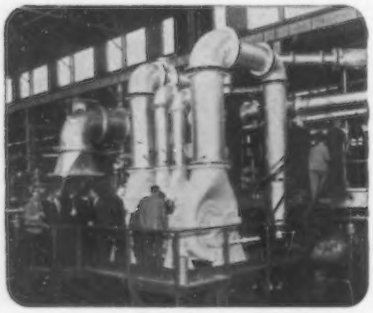
3. one 1,065-hp exhauster has taken the place of six wet vacuum pumps totaling 1,285 hp — a net saving of 225 hp! In addition to saving up to 25% on driver horsepower . . .



4. from 70 to 90% of its power is recovered as hot air for drying — saving the cost of steam and the capital investment for air heater equipment. All this is possible because . . .



5. the multi-stage centrifugal exhauster is designed with multiple inlets that provide three separate vacuum pressures as required by the installation. To see this innovation . . .

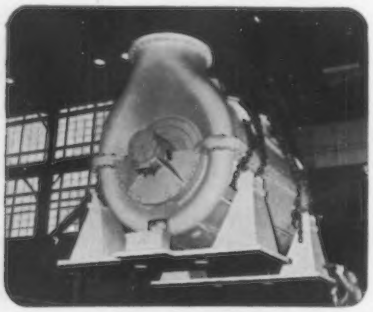


6. paper makers from all over the country visited an open-house demonstration at the Ingersoll-Rand plant, where the Central Vacuum System was in actual operation. Here they saw that . . .

7. the centrifugal exhauster ran so smoothly that a coin stood on edge on the bearing housing without a quiver. And, through a window in the casing . . .

8. they could see that the discharge air was completely dry, without even a trace of moisture, making it an ideal heat source for drying. This is due to . . .

9. the unique primary separators designed by Ingersoll-Rand — units that proved so efficient in removing moisture that secondary separators are used only for back-up protection. Later . . .



10. the first Central Vacuum System ever built in America was shipped to a leading paper mill. Two other systems are already on order. For complete information, send for Bulletin 8289.

Ingersoll-Rand

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COMPRESSORS • VACUUM SYSTEMS
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& HOISTS • AIR TOOLS • LOG BARKERS
REFRIGERATING UNITS

PJT PAPER TRADE JOURNAL

WEEK OF OCTOBER 30, 1961

Doeskin Shareholders Group Opposes Sale to U.B.C.

Edward C. Kalaidjian, counsel for the trustee of Equitable Plan Co., which holds 198,480 Doeskin shares, reports he is acting in behalf of a stockholder's committee formed last week, representing approximately 350,000 shares. The committee opposes the sale of Doeskin assets and wants to rehabilitate the company under stockholder management when the receivership under which it is operating ends.

Thomas J. Connellan and Frank I. Betsch, who have operated Doeskin as court-appointed fiscal agents since December 3, 1960, forwarded the offer without comment to Federal District Judge Edmund L. Palmieri of the Southern District of New York. Judge Palmieri set the hearing on November 10 to consider the Union Bag proposal and any others that may be made up to that time.

Doeskin Products was placed in receivership following court action by shareholders of Equitable Plan Co. and Swan-Finch Oil Corp. All three concerns were once controlled by financier Lowell M. Birrell, who was indicted in 1959 by a New York County grand jury on charges of defrauding Doeskin and Swan-Finch of $14 million. Mr. Birrell is believed to be in Brazil. Shareholders were informed earlier this month that Union Bag proposes to pay $4,662,000 in cash for the company's assets, from which would be deducted $1,666,000 in current liabilities calculated as of May 31, 1961. The net proceeds to Doeskin would be $2,996,000, a figure subject to any tax claims against the company and claims from any pending litigation.

Hercules Planning Multi-Million Dollar Tall Oil Fractionating Plant

The Hercules Powder Co. has announced plans for construction of a multi-million dollar tall oil fractionating plant in Portland, Ore.

The plant, first of its kind on the West Coast, will have sufficient capacity to utilize the crude tall oil available from kraft pulp manufacturers in the timber regions of the Pacific Northwest. Hercules, a supplier of chemicals for the paper industry, is also a producer of rosins and fatty acids from tall oil fractionation plants in Franklin, Va., and Savannah, Ga.

The fractionation facilities will be located on the existing Hercules plant site at Portland. This plant produces rosin size and other papermaking chemicals. Construction will start immediately, and the plant is expected to be in operation within a year. This will make available, for the first time, a market for crude tall oil from the pulp mills in this area. Extensive chemical research and market development work by Hercules, and others, has made possible the production of many useful chemical derivatives from the by-product.

The fatty acids, obtained from processing the crude tall oil, find a major market in the manufacture of protective coatings as well as in such industries as printing inks, linoleum, petroleum processing, flotation agents, disinfectants and detergents.

First Paper Mill for Indonesia Announced

Indonesia's first paper mill will be constructed next year at Makassar in the South Celebes, the industries department has announced. The $6,000,000 cost will be paid for from Japanese war reparations funds.

Three Month Old Finch, Pruyn Strike Settled

A strike that has shut down the Finch, Pruyn & Co. mill at Glens Falls, N. Y., for nearly three months has been settled.

Members of six unions representing pulp and paper workers, plant firemen, machinists, carpenters and electricians, voted 210-47 acceptance of a new, two-year contract.

Federal Paperboard Orders Stock Preparation System

E. D. Jones Corp., Pittsfield, Mass., member of the Beloit Group, has announced that Federal Paper Board Co. has placed an order for a completely integrated stock preparation system for Federal's new mill at Versailles, Conn.

The system, representing the most advanced concepts in board mill stock preparation, engineering and equipment, is considered to be the largest single stock system order in the history of the paper industry. The proposed mill will produce a wide variety of high grade board products.

Paper and Paperboard Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending October 14, 1961, at 93.8 per cent, compared with 92.3 per cent, revised, for the preceding week. The ratio was 95.3 per cent for the corresponding week a year ago.

The National Paperboard Association reported the paperboard production ratio for the week ending October 14, 1961, at 98 per cent, compared with 97 per cent for the preceding week and 94 per cent for the corresponding week a year ago.

(Detailed Statistics on page 48)

PAPER PEOPLE

R. O. Stephenson

E. C. Jones

Champion Names Ohio Division Manager

Champion Papers has announced that Robert O. Stephenson will succeed Earl C. Jones as division manager of the Ohio Division in response to Mr. Jones' request to be relieved of the "heavy responsibilities of the division manager's office." At the request of Karl R. Bendetsen, Champion president, Mr. Jones agreed to continue to serve the division in a consulting capacity.

Mr. Stephenson has been a member of the Champion organization for 30 years. His background covers all phases of paper manufacturing. He started in inspection and became head of that department in 1938. In 1950 Mr. Stephenson was named supervisor of inspection and customer service, and in 1952 he advanced to the position of assistant production manager. He was appointed production manager in 1958 and assistant division manager in 1961.

Mr. Jones joined the Ohio Division of Champion Papers in 1928 after 11 years with the Fox Paper Co. He started as a paper machine backtender and advanced through supervisory ranks to become superintendent of the paper mill in 1948. He was named production manager in 1950, assistant division manager in 1958, and division manager last year.

Steiner Fills Executive Posts

Three executive appointments for the Steiner Co., a division of Steiner-American Corp., Chicago, have been announced.

Robert L. Steiner has been appointed general manager, with responsibility for production and marketing. Formerly vice president in charge of production, he joined the firm in 1949.

Paul Solheim has been named sales manager. He will direct the company's sales activities in the paper products field. Before his new appointment, Mr. Solheim was resident manager of Steiner's paper mill at Albany, N. Y. He joined the company in 1949.

Ed Lemke has been made manager of customer service. Formerly resident manager of Steiner's Kaukauna, Wis., converting mill, he has been with the company since 1955.

Steiner manufactures and distributes a complete line of sanitary papers, controlled roll towel dispensers, roll and folded towels, napkins and toilet tissue.

PCA Names Special Kraft Products Salesman

Robert G Jordan has been appointed special product sales representative of the paperboard division of Packaging Corp. of America.

Mr. Jordan will be located in the corporate offices of the company, in Evanston, Ill., and will be responsible for the development of grades and distribution of special products from Packaging Corp.'s bleached kraft mill at Filer City, Mich.

Prior to his appointment, Mr. Jordan was a sales representative of Hoerner Boxes, Inc., in Chicago. He was formerly Midwestern sales manager of the kraft division of St. Regis Paper Co., having served that division in various sales capacities since 1952.

Henderson Joins Northwest Paper's Sales Staff

Norman W. Henderson has joined the sales staff of The Northwest Paper Co. Mr. Henderson will operate from the company's national sales headquarters in Chicago.

Mr. Henderson was affiliated with Brown Co. since 1954 and formerly with paper merchants in Florida and New York.

Alberta West Names Olmstead a Director

Ralph W. Olmstead, Cleveland, Ohio, has been appointed a director of Alberta West Newsprint Mills, Ltd., Edmonton. Prior to his position as president of The H. K. Ferguson Co., Mr. Olmstead, a lawyer and well-seasoned administrator, had been executive vice president of Ferguson since early 1958, responsible for administering the engineering and construction firm's far-flung operations. He joined Ferguson in 1954. He was elected a director of the company in 1956.

For nearly four years, before joining Ferguson, Mr. Olmstead was associated with Morrison-Knudson, Co., Inc., parent concern of Ferguson as manager of special projects.

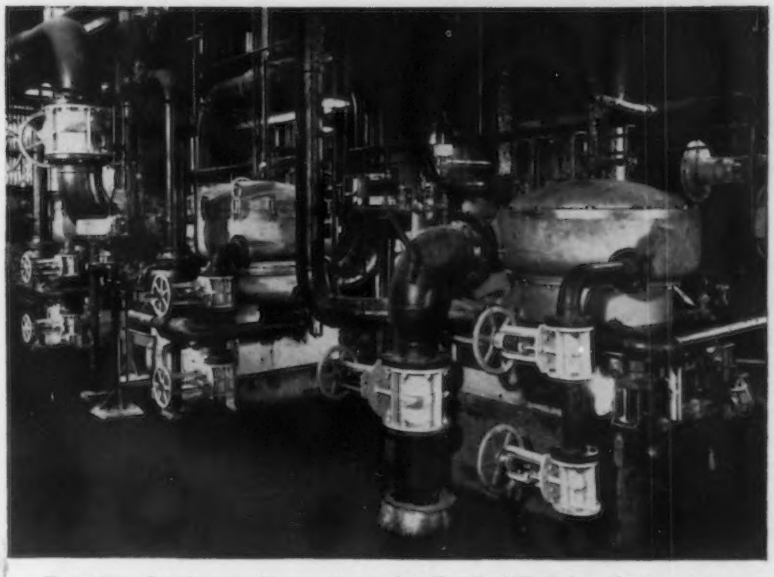
In 1946, Mr. Olmstead served as operational director of the United Nation's Relief and Rehabilitation Association (UNRRA) in China, and also as an adviser to Chinese Premier T. V. Soong, on transportation and food problems.

The following year, in Shanghai, Mr. Olmstead became managing director for two American companies, moving to Hong Kong when the Communists overran the country

On Pulp

Bird Centriscreens are delivering cleaner stock at lower screening cost per ton, on mechanical groundwood, bleached kraft, bleached sulphite, high yield sulphite and in black liquor at the washers.

Capacity. Centriscreens come in *four sizes* to meet every volume need. The *new Model 18 Centriscreen* delivers up to 10,000 gallons per minute.

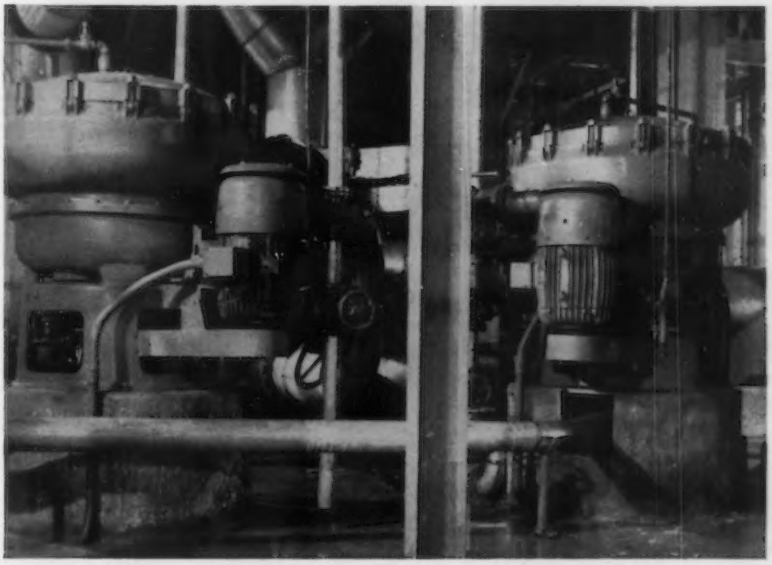


These three Centriscreens (the smaller one handling the tailings from the two primary screens) are doing interstage screening ahead of the washers in a large sulphate pulp mill.

BIRD CENTRISCREENS

On Paper

Bird Centriscreens handle all kinds and grades, supplying uniformly clean stock to the head box at the desired pressure, in small space at low power and maintenance cost.



These two Centriscreens are helping to guard the quality reputation of a mill making high grade soda and sulphite specialties. They are located directly below a modern Fourdrinier machine.

NEW BULLETIN

Just off the press, the full story-with-pictures — on what the Centriscreen does, how it works, how it's applied to make better pulp and paper. May we mail you a copy?

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND 4, OREGON • ATLANTA 9, GEORGIA
Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

In 1949 and returning to the United States a year later.

In 1933, he joined the U. S. Department of Agriculture and served as assistant to Secretary Henry A. Wallace and then to Secretary Claude Wickard. In 1941 he was appointed assistant administrator of the Agricultural Marketing Administration.

Cons. WP&P Promotes Four

Donald G. Pryor has been named to the new position of quality control supervisor at Biron Division of Consolidated Water Power and Paper Co., Wisconsin Rapids, Wis.

Mr. Pryor began his employment with the company in 1959. He is a graduate of Western Michigan College where he received a B.S. degree in paper technology. He has been serving as a process engineer in the division's technical department.

At the Wisconsin Rapids Division Clarence Kobishop has been promoted to the new position of assistant paper machine superintendent. William Crueger has been appointed paper machine tour foreman, succeeding Mr. Kobishop.

Mr. Kobishop has been employed at Wisconsin Rapids since 1933 and has been a tour foreman since 1955. Mr. Crueger began employment with the company in 1920 and has been a machine tender since then.

David A. Larsen has been appointed sulphite superintendent. He succeeds William Prebbanow who recently retired.

Mr. Larsen joined the company in 1953 following graduation from Michigan College of Mining and Technology.

Veteran Groveton Papers Engineer Retires

Lewis Mayhew has retired from the Groveton Papers Co. mill, Groveton, N. H., where he has been employed for 49 years. For the past 38 years he had been a mill engineer on paper machines.

Abitibi P&P Announces Senior Management Changes

Abitibi Power & Paper Co., Toronto, Ont., has announced the following changes in the senior management of the company:

The resignation of W. H. Smith as vice-president and director of Abitibi Power & Paper and his election as honorary director of the company;

the election of P. E. Roberts, executive vice president, to the board of directors;

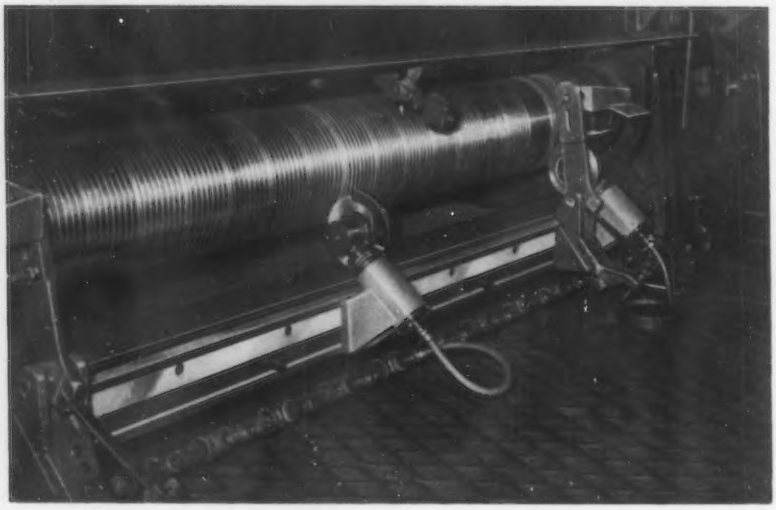
the appointment of J. E. Cottrelle as vice president of Abitibi Power & Paper and the appointment of G. M. Brain as vice president and general manager of Abitibi Sales Co., Ltd.

Fibreboard Makes Personnel Transfers

Robert S. Towne, who for the past six years has been plant engineer of Port Angeles, Wash., division of Fibreboard Products has been transferred to the company's Vernon mill at Los Angeles. There he will fill the position of assistant chief engineer and will be connected with the carton plant as well as the paper mill.

Edward J. Cavanaugh will replace Mr. Towne as plant engineer at the Port Angeles plant. Mr. Cavanaugh, a long time employe of the company, was employed at the Port Angeles division as resident engineer for many years. In 1955 he was transferred to the company's San Joaquin operation where his last position was production superintendent.

JAGENBERG
"MULTI-SHEAR" SLITTERS



"MULTI-SHEAR" Slitting Unit in a popular score-cut winder

- READILY INSTALLED IN MANY SCORE-CUT WINDERS
- SUITABLE FOR NEARLY ALL GRADES OF PAPER AND BOARD
- PROVEN IN HUNDREDS OF WINDERS

Many types of score-cut winders can be converted to shear cut without extensive rebuilding by installation of a JAGENBERG "MULTI-SHEAR" slitting unit. Operators appreciate the greatly reduced set-up time of JAGENBERG "MULTI-SHEAR" slitters as compared with conventional shear cut systems.

When changing a winder from score cut to shear cut we replace the platen roll with a patented air-clamp slitter shaft. This shaft carries a large number of glass-hard steel bushings each of which has eight cut grooves to serve as bottom slitters. No tools are required to position the cut where it is needed. The run of the paper web is the same as for score cut.

Manual or pneumatic top slitters for the "MULTI-SHEAR" system are mounted on existing top slitter bars.

For full details of the "MULTI-SHEAR" slitting system contact

JAGENBERG USA, INC., 300 Park Avenue South, New York 10, N. Y.

In Canada: **JAGENBERG OF CANADA LTD.,** 209 Davenport Rd., Toronto 5, Ont., Canada

NEW LITERATURE

Cascade Control

Outlines the elements of cascade control of chemical processes in fields such as paper, petroleum, chemical production, food processing, and metalworking. Advantages are given and various systems of instruments that give this type of control are presented schematically. Bulletin 91-53P-04, Fischer & Porter Co., 26 Jacksonville Rd., Warminster, Pa.

Industrial Gas Data

Bound in leatherette for durability and pocket-sized the Airco Industrial Gas Data booklet lists physical and chemical properties of many industrial gases. Conversion tables provide a simple and fast method for changing volumetric information on the various industrial gases from one equivalent unit of measure to another. Illustrated with charts and diagrams, the booklet also provides capacity data on industrial gas delivery and storage systems. 48 pp. Form ADE-890. Air Reduction Sales Co., Div. of Air Reduction Co., Inc., 150 East 42nd St., New York 17, N. Y.

Clay Conveying And Storage Facilities

Discusses design information and problems encountered in the design of conveying and storage facilities for clay in the paper and board industry. A table is included which lists grades of clay and indicates their bulk density and percentage of moisture. Drawings show different methods of bin withdrawal, a cut-away view of a typical unloading unit and a representative mill in four stages of expanding its facility. Fact File ER-26-4. Fuller Co., Catasauqua, Pa.

Tank Fabrication With Corrosion Data

Gives a behind-the-scenes picture of the wide scope of machinery, tools, materials, techniques and quality control procedures used in the fabrication of tanks, pressure vessels and other plate-fabricated equipment. Numerous examples of Nooter-built products in a variety of sizes, shapes and metals are shown. Of special interest are detailed corrosion data charts, showing the corrosive effects of almost 400 salts, acids and other materials on 16 different types of metals and alloys. 36 pp. Illustrated booklet. Nooter Corp., 1450 South Third St., St. Louis 66, Mo.

Capstan Type Car Spotters

Describes Link-Belt's 5-h.p. capstan-type car spotter, which features increased load ratings of 6,000-lb. starting pull and a 3,000-lb. running pull. Two models are outlined: Model 55A with foot-mounted motor on a bracket fastened to the housing and model 50A which has a flange-mounted motor as an integral part of the unit. Both types are also available with steel frame carriages and wheels for easy portability. Leaflet 2892A. Link-Belt Co., Dept. PR, Prudential Plaza, Chicago 1, Ill.

Electrohydraulic Servo Controlled Pumps

Explains and illustrates, both schematically and pictorially, how electrohydraulic servo-controlled one and two-way, variable delivery pumps in capacities up to 108 g.p.m. and 3000 p.s.i. function. Other pages describe amplifiers, preamplifiers, preset units, manual units, transformers, transducers, control panels, consoles, cylinders and hydraulic motors. Space is also devoted to typical control systems for simple open and closed circuits, multiple command, position control and pressure control. Bulletin 47740. 20 pp. The Oilgear Co., 1571 West Pierce Street, Milwaukee 4, Wis.

Multivalve Steam Turbines

Illustrates with cutaway drawings and detailed descriptions the various types of M-line high-speed mechanical drive steam turbines. Manufacturing, quality control and research, and development facilities are highlighted. Booklet B-8227. Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

Standard Tiger Crane

Illustrates and describes heavy-duty crane in capacities from 5 to 30 tons for Class D crane service, at a price never before possible. Bulletin No. 95, Whiting Corp., Harvey, Ill.

Polyethylene Resins For Coatings

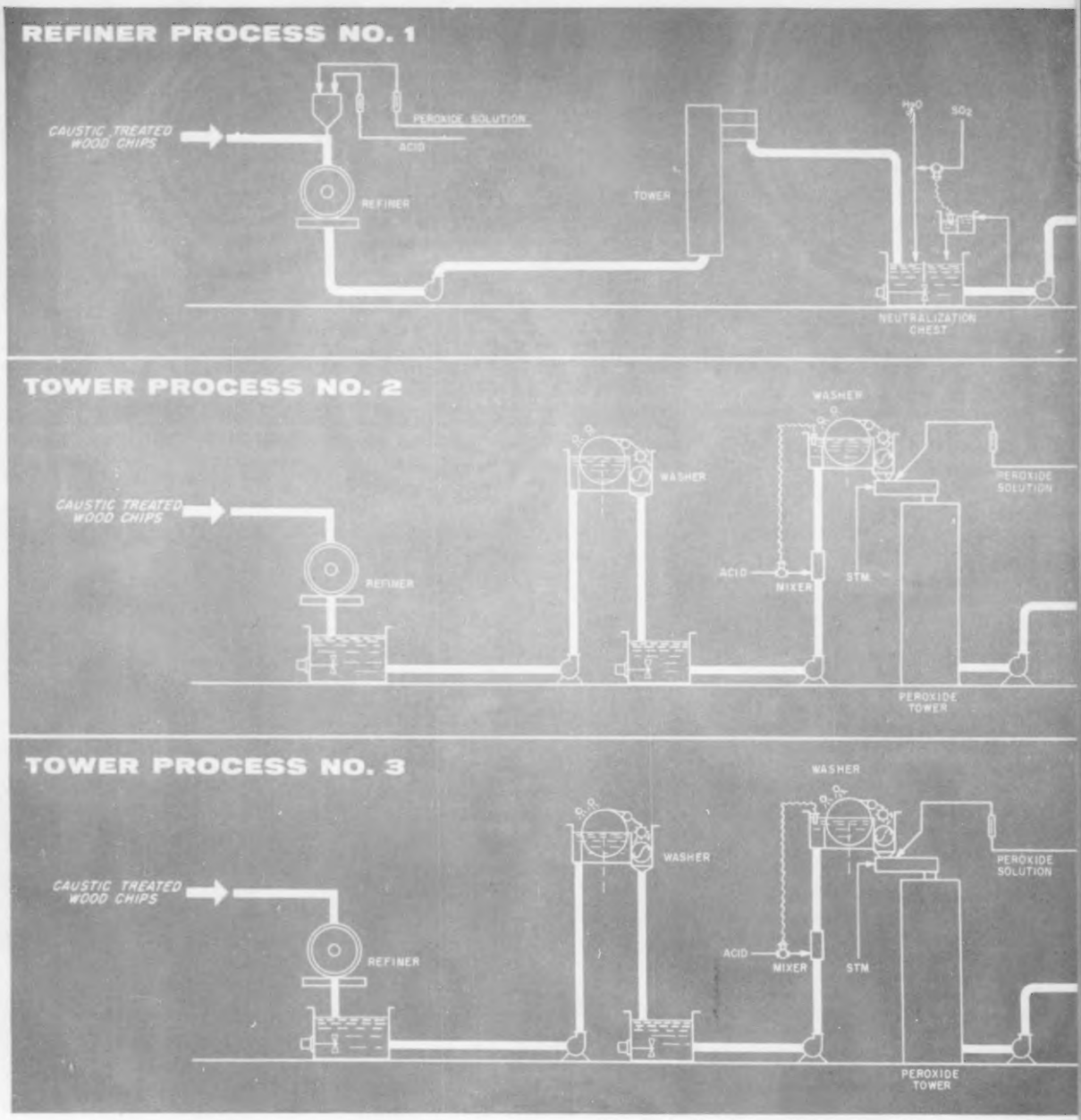
Lists the physical properties and principal industrial applications of Eastman's line of Epolene low-molecular-weight polyethylene resins. Property data and uses are tabulated for twelve types of emulsifiable and non-emulsifiable Epolene resins. Major process application for Epolene low-molecular-weight polyethylene resins are in the fields of paper coatings, hot-melt adhesives, among others. Bulletin F-110, Eastman Chemical Products, Inc., Kingsport, Tenn.

Stock Flow Control System

Lists and describes the elements of the system and cites a few of the features, such as alarm contacts to indicate pump failures and stock shortages, that can be added to the basic system. Illustrated by a simple engineering drawing. Bulletin 90-26-14. Fischer & Porter Co., 999 Jacksonville Rd., Warminster, Pa.

Wood's Bearings

Covers all sizes and styles of "Life-Lube" permanently lubricated, ball-bearing pillow blocks, flange units and take-up units as well as porous-bronze and babbitted pillow blocks. Bulletin No. 7104. T. B. Wood's Sons Co., Chambersburg, Pa.



Which process is best for

experience can help you make the right

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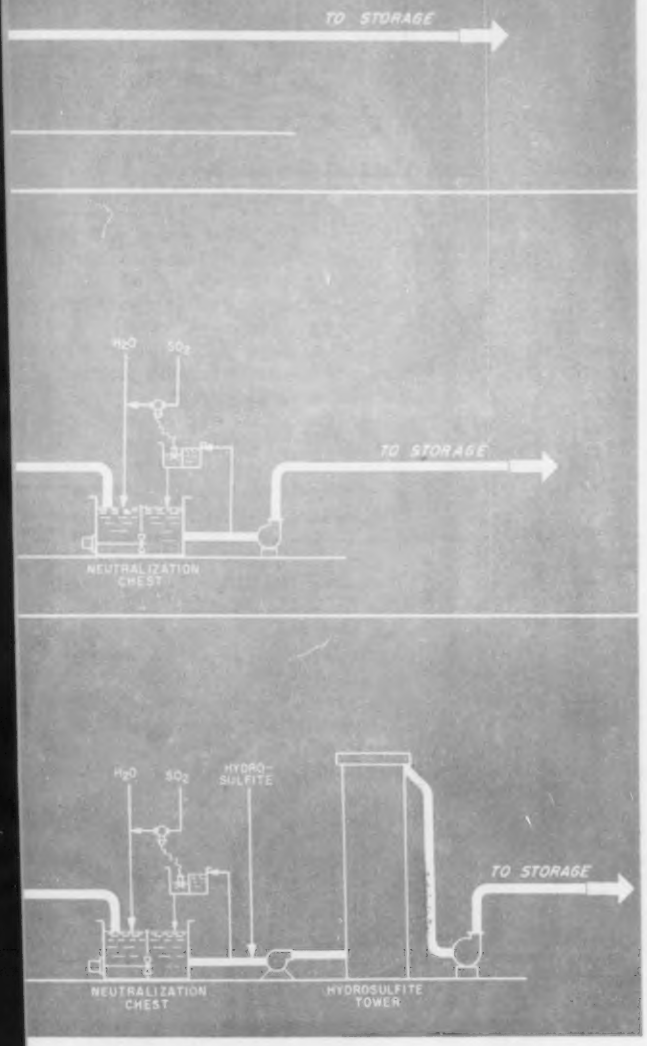
CALL ONE OF THESE MEN... LET HIM WORK WITH YOU IN MAKING THIS IMPORTANT DECISION:

Blueprints for Better Bleaching



Du Pont experience has helped many mills make the right choice between tower or refiner bleaching for cold caustic pulp based on brightness requirements. For example:

60 brightness. In process No. 1 at left, caustic-treated wood chips enter refiner and are bleached with "Albone" hydrogen peroxide and acid*. The use of acid controls the alkalinity of the bleaching reaction and assures maximum response from the hydrogen peroxide. Sulfur dioxide (SO_2) then neutralizes the bleached pulp and stabilizes the brightness obtained in the refiner. **Du Pont Patent Pending.*

65 to 75 brightness. In process No. 2 at left, pulp is refined, washed to remove caustic solubles, acidified with sulfuric acid to remove acid solubles, washed, and bleached in a conventional peroxide tower to desired brightness in the 65 to 75 range.

70 to 80 brightness. In process No. 3 at left, pulp goes through the same steps as in process No. 2. Then pulp is neutralized, and bleaching is completed in a hydrosulfite tower for maximum brightness in the 70 to 80 range.

Electrochemicals Department, Peroxygen Products Division
Wilmington 98, Delaware

ALBONE® hydrogen peroxide — **DU PONT** (REG. U. S. PAT. OFF.) — **SOLOZONE®** sodium peroxide

BETTER THINGS FOR BETTER LIVING...*THROUGH CHEMISTRY*

bleaching cold caustic pulp? Du Pont choice between tower or refiner bleaching nvestment and chemical costs.

Midwest Area
W. L. Liike, Chicago, Ill.—INdependence 3-7250

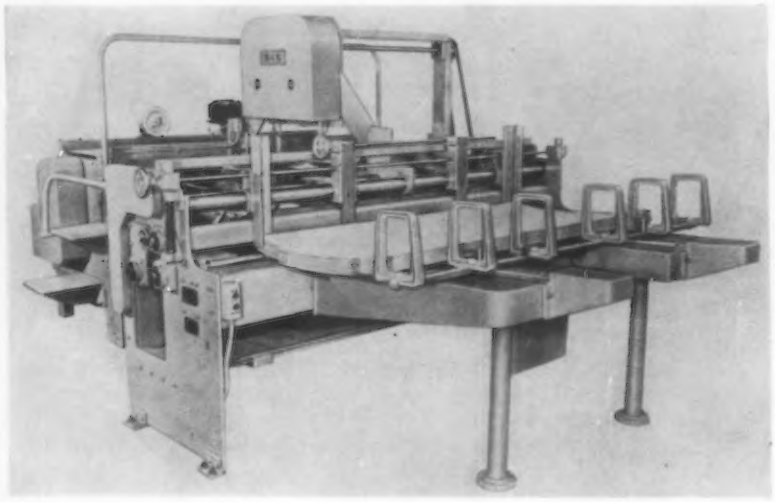
West Coast Area
P. E. Kiefer, Portland, Oregon—CApital 7-1281

New York & Boston Area
C. R. Lombard, New York, N. Y.—LOngacre 3-6440

Southern Area
R. W. Hammond, Charlotte, N. C.—FRanklin 5-5561

Or call: A. T. Hawkinson, Wilmington, Delaware—PRospect 4-4698

NEW EQUIPMENT & SUPPLIES



Folder-Gluer-Stitcher Sets-Up For One-Man Operation

S & S Corrugated Paper Machinery's improved Model ZS Automatic Folder-Gluer-Stitcher is said to be ideal for small plants where there is a demand for a variety of box joints, but not enough to justify a single-purpose automatic machine.

The machine may be purchased to perform the basic operations of feeding, gluing, folding, squaring, feathering, and delivery; this is accomplished by using the automatic folder with an integral glue lap unit and Model-JZSA squaring and delivery unit. At a later date, a semi-automatic stitcher may be added between the folder and delivery. It is not necessary to move the stitcher when gluing.

One-man operation is achieved by installing a return conveyor with a Model CT Counter Stacker at the end of the delivery unit that will bring the finished boxes back to the operator. By regulating the speed of the folder, the operator has ample time to both feed blanks into the hopper and remove counted stacks of finished boxes; the stacks can either be tied or placed loose on skids for palletizing.

Quick automatic set-up is offered through convenient push button stations.

All components on operating and drive sides—hopper side and front gauges, folding wings, straightening rolls, and intermediate pull rolls—are moved simultaneously to the precise panel size by moving a directional drum switch and following the pointers on the panel size scale.

The improved Model ZS Automatic Folder-Gluer-Stitcher will handle solid fibre as well as A, B, C, double face, and double-double corrugated fibreboard blanks at speeds up to 100 blanks per minute. Size range of the machine is: minimum blank 12 x 25 inches, exclusive of lap; maximum blank 54 x 107 inches, exclusive of lap. The ZS takes only a minimum of valuable floor space: 10 feet, 10 inches in width, 17 feet, 11 inches in length. S & S Corrugated Paper Machinery Co., Inc., 160 North Fourth Street, Brooklyn 11, N.Y.

Vinyl Emulsion For Flexible Coatings

Shawinigan Resins has announced the availability of Resin D-886, a vinyl emulsion which provides tough, flexible films possessing a balance of properties particularly suited to paper applications.

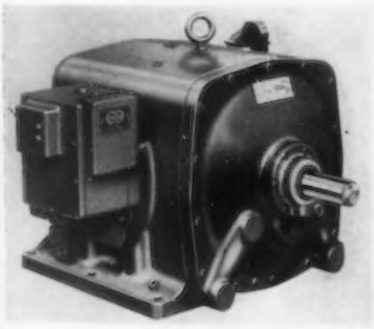
Cast films of the product are cured by the application of heat. These cured films are said to be highly resistant to water and to organic solvents. In addition, the films possess a high degree of inherent toughness and have pigment binding characteristics.

As a paper coating, the use of Resin D-886 results in clear, glossy, non-blocking coatings. Its resiliency eliminates cracking from sharp folds and it coats well on all types of coating equipment, including curtain coaters. Write Department RL, Shawinigan Resins Corp., Springfield, Mass., for further information.

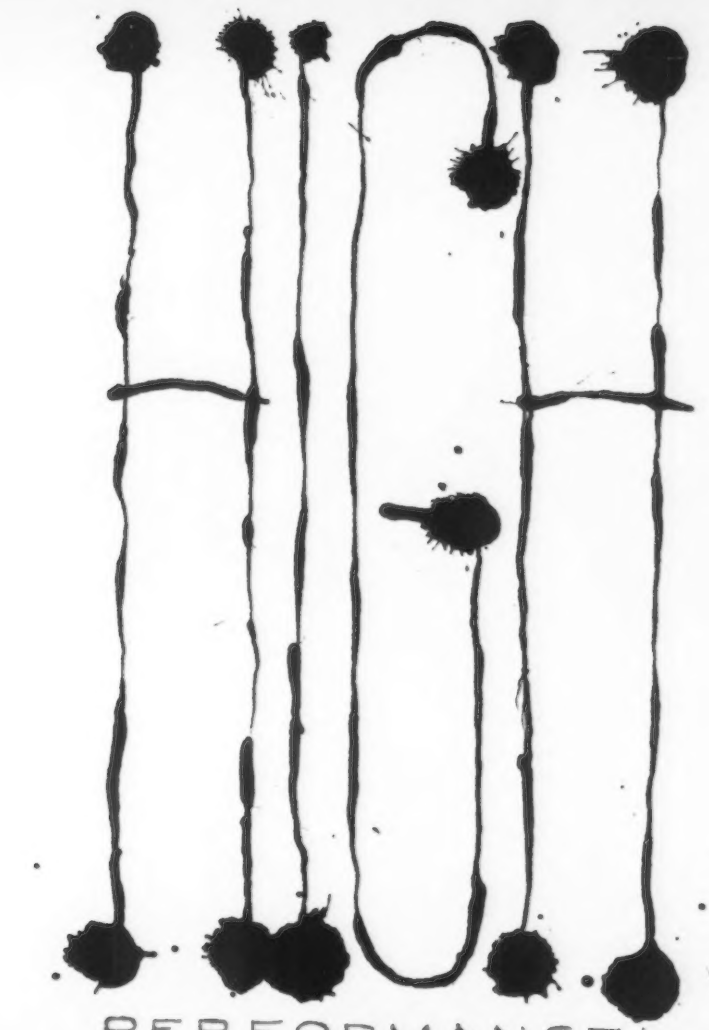
Electrohydraulic Servo Controlled Pumps

Oilgear is building a complete line of type "DV" heavy-duty, two-way variable displacement pumps with electrohydraulic servo operated controls. Any number of variable low level (five watts or less) electrical input signals from remote positions, can proportionately vary the rate of pump flow from either directional port. The Oilgear single stage, "Swing-Plate" type, servo control valve directs low pressure fluid to or from stroker to vary pump displacement from zero to maximum in 0.15 of a second on small units and in 0.25 of a second on large units. Strokers with smaller cylinders for higher pilot pressure to reverse maximum flow in large pumps in 0.10 of a second are available.

Extremely slow, precisely timed acceleration and deceleration rates up to 3 minutes, or even slower, can be provided. An integral linear variable differential transformer provides feedback for accurate selection of pump volume. An automatic "fail-safe" device for moving pump to neutral when power fails is available. Compensation for variation in slip as pressure increases is easily applied.



Oilgear type "DV" Pumps range in sizes from 13 to 169 g.p.m. for pressures up to 1350 p.s.i. and from 5 to 108 g.p.m. for pressures up to 2050 and 3000 p.s.i. They are de-

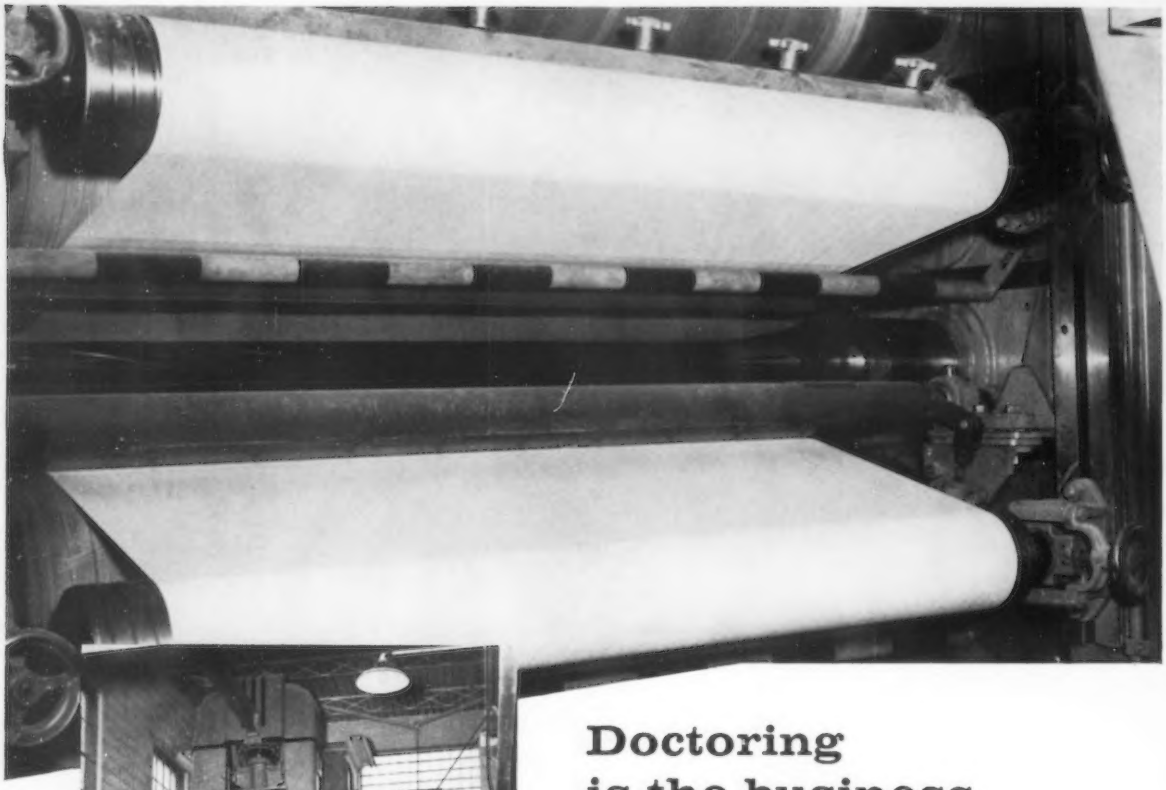


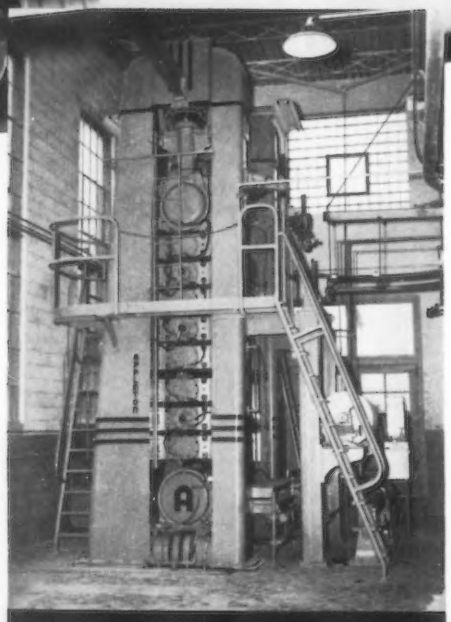
COST PER TON!

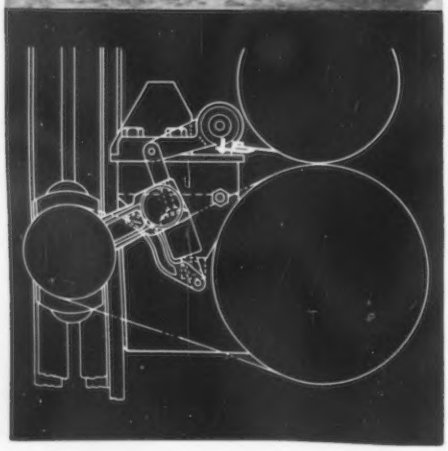
FOR BEST VALUE AND UNMATCHED

TECHNICAL SERVICE.....JOIN THE

SWITCH TO.....HUYCK FELTS!







Doctoring is the business of specialists

AS DOCTORING SPECIALISTS, Lodding is constantly joining forces with progressive machine builders to achieve excellence in doctor performance for papermakers everywhere.

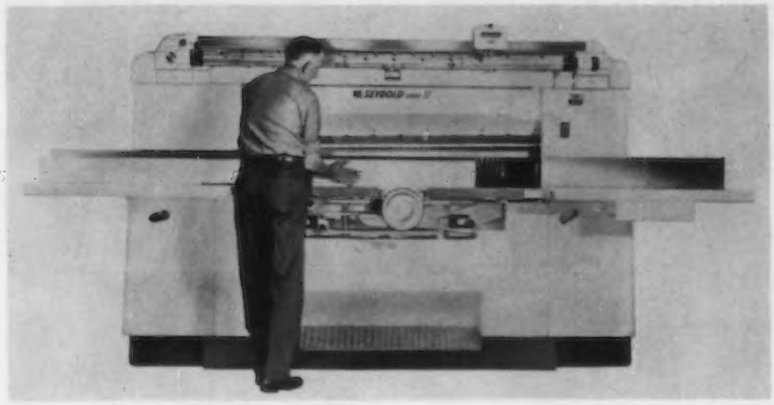
It was through just such a combination of engineering and manufacturing skills that the first successful installation of doctors was made on a supercalender running inked, waxing stock. It took place in 1948 at the Badger Paper Mills.

Ever since, these same Lodding Doctors, custom designed for the Appleton Machine Company, have had a notable record of performance keeping the rolls clean and shiny. The supercalender was engineered to apply 2000 lbs. per lineal inch nip pressure at the bottom nip, while operating at speeds up to 1600 fpm.

They were among the first doctors to be equipped with multiple station hydraulic oscillation. Now, with wider and faster machines, the importance of calling on specialists to solve doctoring problems increases. Lodding is always ready to accept any doctoring assignment, no matter how difficult, in cooperation with the machine builder or directly with the papermaker.

When you want excellence in doctor performance, specify Lodding.

LODDING
Engineering Corporation
AUBURN, MASSACHUSETTS



65-INCH CUTTER Saber II is available as a power backgauge or Auto-Spacer model, with a 77 inch Seybold air film back table and two auxiliary steel side tables standard equipment on both models. Has hydraulic cushion-contact clamp; inline cutting action; fully automatic Auto-Spacer with six-sided spacer bar and removable job strips; knife-changing knobs as an integral part of the electrical control panel; and spline-type electro-magnetic brake-clutch. Harris-Seybold Co., 4510 East 71st Street, Cleveland 5, Ohio.

signed with integral control; built-in gear pump; high pressure relief, gear pump relief and suction valves; minimizing system component installation. Two-way pump design cushions reversal of flow to system. Flow and pressure decelerate to zero before flow ports are reversed by the pump; flow then accelerates to commanded volume from the other port. Slideblock is moved and held hydraulically.

Manual control units, preset units, amplifiers, pre-amplifiers, reference transformers, synchros, tachometers, relays, switches, panels and other components for remote control of Oilgear "DV" pumps are available. The Oilgear Co., 15716 W. Pierce Street, Wilwaukee 4, Wis.

Epoxy Compound Repairs Cracked Concrete Surfaces

Dennis Chemical Co., after extensive field tests, offers its No. 6713 Epoxy Surfacing Compound for floors tanks and other surfaces. When applied ⅛ to ¼ inch thick, No. 6713 equals the strength of up to two inches of concrete. It can be feather-edged, is particularly suited for patching or overlaying of concrete, wooden, or steel floors, surfacing walls, and lining the inside of tanks. Providing an impervious, alcohol, acid and abrasion resistant surface, No. 6713 is a tool for quick maintenance and repair of floors, roadways, reservoirs, silos, and chemical tanks. For information write Dennis Chemical Co., 2701 Papin Street, St. Louis 3, Mo.

High Capacity Steam Generator Occupies Only 29 cu. ft.

An actual steam generator, not a model, designed for producing 150,000 pounds per hour steam, is only 4 ft high and 3 ft in diameter. A development of Reaction Motors Division, Thiokol Chemical Corp., the Hyprox Combustor, or steam generator, is available in a variety of flow capacities and pressures. It operates on hydrogen peroxide, gaseous hydrogen and water. The peroxide is decomposed catalytically and the oxygen in the decomposition products is afterburned with a small amount of gaseous hydrogen to make highly superheated steam. Water is added to reduce temperature and increase steam weight flow. Here are some of the major advantages claimed for the Hyprox Steam Generator:

A complete steam generating system with the Hyprox unit including the cost of propellant (fuel) tanks would be approximately $100,000.

The Hyprox Generator can be in operation in less than three months.

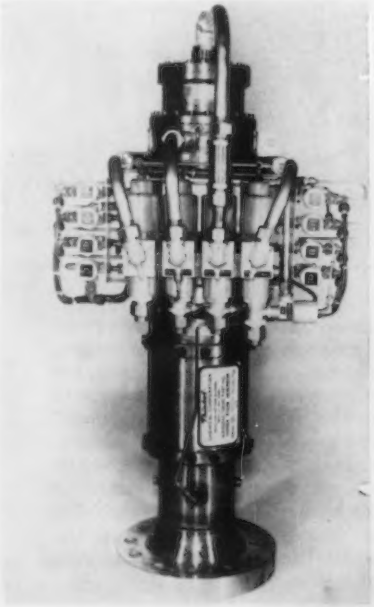
No warm-up required. The Hyprox unit is in complete operation at the push of a button.

Start stop operation. The Hyprox unit is designed specifically for start stop operation and intermittent service.

No pilot light or sparking is required since the ignition is controlled through temperature variation.

No supporting equipment is required.

The relatively high cost of hydrogen peroxide makes the Hyprox Generator too expensive for continuous steam production at this time. Its major anticipated use is in those installations where intermittent peak loads of extremely high pressure and high flow steam are required. It is also expected to see wide use in laboratory and pilot plant operation where it is desirable to experiment with results at high pressures and high flow rates. A further application is its potential use as an emergency standby unit where continuous system operation is critical. The Reaction Motors Division of Thiokol Chemical Corp. is located in Denville, N.J.

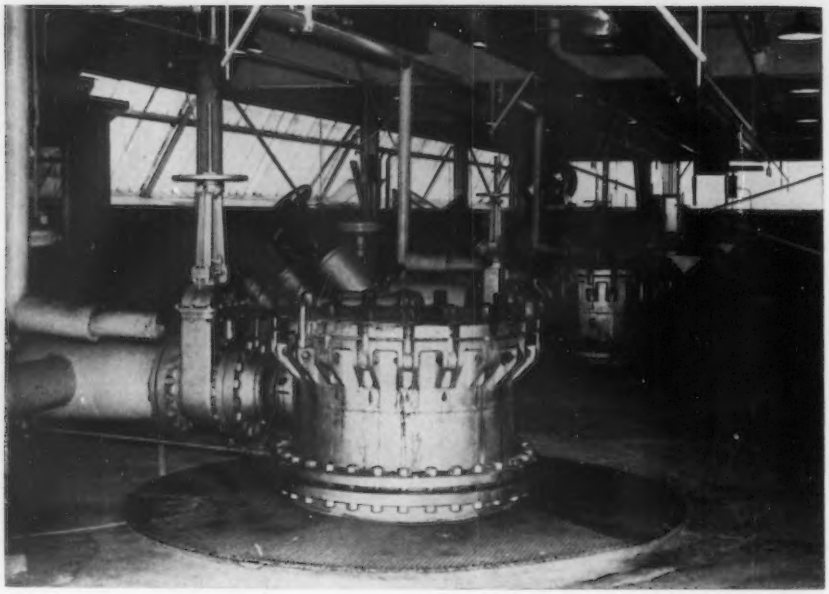


Roller Conveyor Chain Is Self-Lubricating

Production of Rex Redi-Lube roller chain—a self-lubricating chain—has been announced by the roller chain division of Chain Belt Co. The chain was designed especially for drives and conveyors that can't be lubricated regularly.

Rex Redi-Lube's self-lubricating feature is achieved by a heavy, oil-impregnated, sintered steel bushing that replaces the conventional roller and bushing of standard roller chain. The sintered bushing allows "self-feed" lubrication between bushings, pin and sprocket teeth, assuring constant protection against corrosion, abrasion and friction. Redi-Lube chain also prevents tight joints; provides self-cleaning action; and is interchangeable with A.S.A. roller chain.

For further information contact Chain Belt Co., Milwaukee 1, Wis.



Weyerhaeuser's new two-stage FB and HO pulps are produced in these same digesters as are the conventional one-stage magnesium bisulphite pulps.

From These Digesters Comes . . .

The First Two-Stage Premium Sulphite Pulps in North America

Paper Trade Journal is privileged to reveal in this on-the-spot report the first details of Weyerhaeuser's two new magnesium base sulphite pulps and how they are made.

Harry Dyer,
Associate Editor,
Paper Trade Journal

When Weyerhaeuser erected its plant in 1957 at Cosmopolis, Wash., the company established two important milestones: . . .

- It was the first paper-pulp sulphite mill to be built in the United States in 20 years.
- It was the second sulphite mill in this country designed especially for magnesium base cooking, and the second built from the ground up . . .

. . . To this must be added a third and very significant milestone:

- It is now the first in North America to produce premium quality sulphite pulps using two entirely different two-stage cooking procedures. As R. J. LeRoux, manager of manufacturing for Weyerhaeuser's Pulp and Paperboard Division, points out (see box), "The new processes give us the versatility to make a wider variety of pulp types for broader market needs."

The two new pulps—both manufactured by a two-stage sulphite cook—are produced in conjunction with

WHY . . . .

adopt pulping processes which require much longer cooking times, plus greater consumption of chemicals, and by their nature be more costly? R. J. LeRoux, manager of pulp and paperboard manufacturing, replied . . .

"We believe that premium quality sulphite pulps will be more and more in demand for many grades of paper. The two-stage processes at the Cosmopolis mill will enable Weyerhaeuser to make a wide range of papermaking pulp ideally suited for grades ranging from glassine to the stronger and more economical business and writing papers, for instance. Furthermore, while full commercial development is still under way at Cosmopolis, the new processes open up the possibilities of pulping species not now used."

the standard magnesium acid sulphite pulp at Grays Harbor pulp mill. Significantly, the very same equipment is generally utilized to manufacture all three types of pulp. No major capital expenditure was required upon commercial adoption of the new processes; the only equipment needed was the installation of additional cooking liquor piping and headers in the digester house.

The new processes turn out premium types of pulps which will meet customer requirements for a high alpha pulp with high-strength characteristics or for a fast beating pulp with high-strength qualities. The following is the first and our exclusive report of how these pulps are made and what their qualities are. Appropriately, the description will begin with the cooking procedures.

Seven Digesters

Cooking is carried out in seven mild steel digesters, each 17 feet in diameter and 60 feet high. Each vessel, which, notably, is of fully-welded construction, contains cement grout lining followed by two courses of high-density brick specially developed for use with soluble base cooking liquors. Inside diameter of each digester is 15 feet, 8 inches. The digesters are equipped for indirect cooking with forced circulation and with motorized blow valves. Principal instrumentation consists of a temperature recorder, pressure recorder and steam controller for each vessel. Chips may be packed into the digester by steam. The procedures for both the new two-stage pulps are as follows:

FB TWO-STAGE ACID

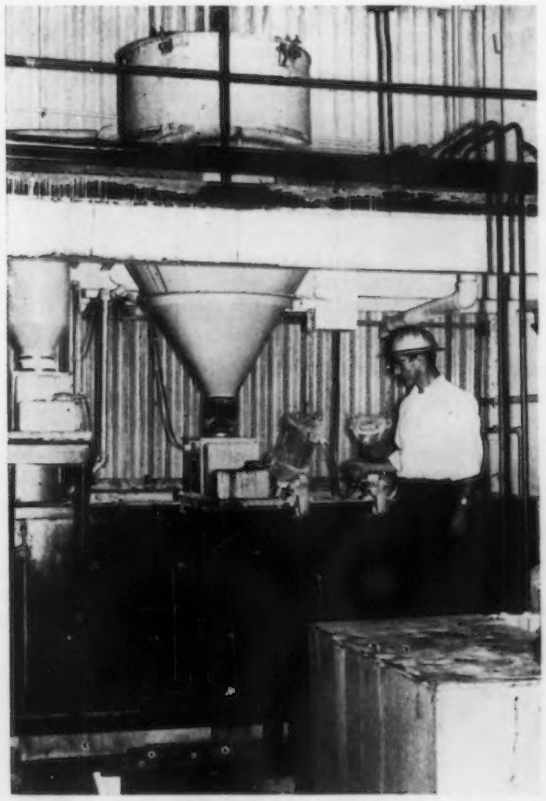
The initial stage is a mildly acid stage in which a high-strength bisulphite acid containing 13.5 to 15.3 per cent total and 9 per cent combined SO_2 (based on wood) is pumped into the digester. Liquor to wood ratio is 5.1-5.2:1. Cooking is then carried out at 150 degrees C. up to 4 hours. At the conclusion of this stage the free-draining liquor is removed from the digester, so that the remaining liquor to wood ratio in the digester is about 2:1. Part of the "drawn" liquor is used to dilute the high-strength acid in the first stage of subsequent cooks, while the remainder is sent to the evaporators in the chemical recovery building.

For the second stage, sulphur dioxide solution is pumped into the digester. Cooking is then carried out at 130-140 degrees C. to the desired PBC number (a measure of bleachability equal to $KMnO_4$ number ÷ 2.41).

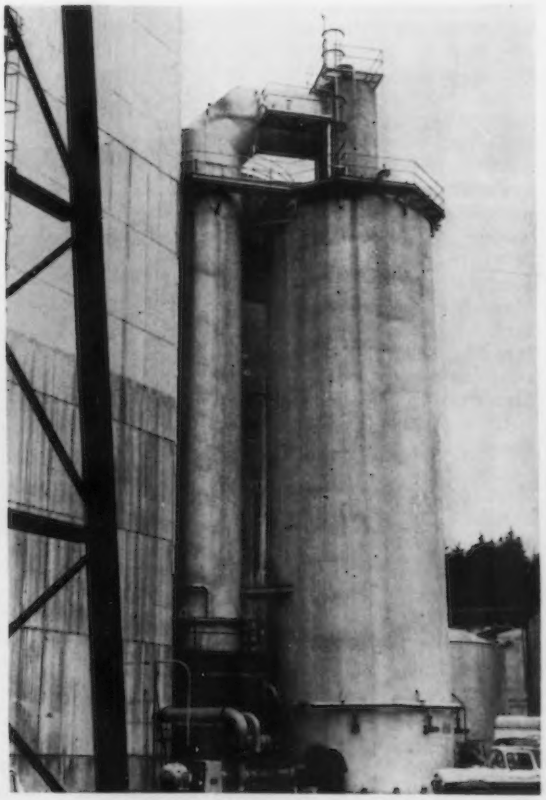
HO SECOND-STAGE NEUTRAL

The digester is filled with a bisulphite acid (of 3.8-4.0 pH) and temperature is brought up to 166 degrees C. First-stage cooking is carried out at temperature for 1 to 1½ hours until a specific PBC number is obtained. At this moment, without relieving digester pressure, pH is adjusted upward to 6.0-6.3 or 6.5 by using MgO slurry. Digestion is carried out for two additional hours at 170 degrees C.

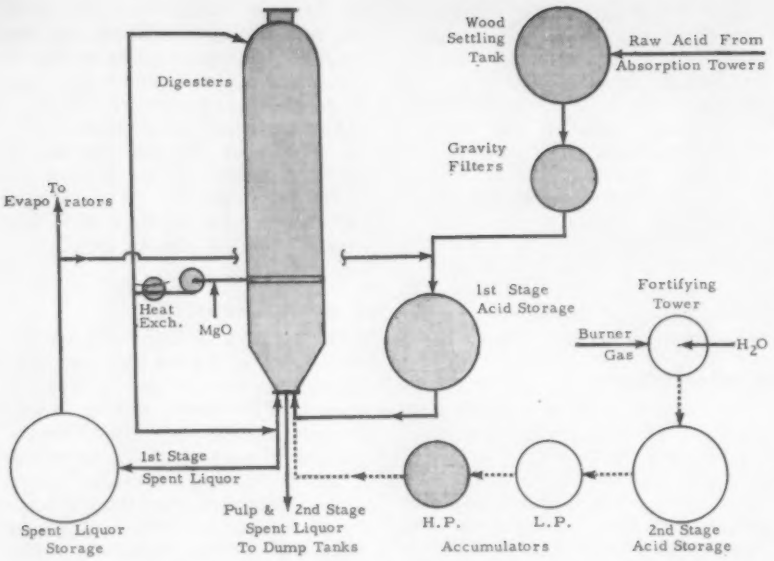
Basic flow of chemicals and liquor make-up for both two-stage pulps are shown on the accompanying diagram. During all stages of both



Project chemist Skip Conger explains system for continuous preparation of peroxide bleach liquor.



To add flexibility to bleach plant, new ClO_2 tower, with pre-retention tube was installed as fourth-stage.



Diagramatic sketch shows liquor preparation and circulation for FB (two-stage acid) cooking. Scheme for HO (second-stage neutral) system can be visualized above: unshaded equipment is not used, and liquor in first stage acid storage instead goes into H. P. accumulator where liquor is fortified with blowdown relief. Flows for side, automatic, and blowdown reliefs not shown.

the two-stage cooks, side and top relief are taken into the high pressure accumulators. At the conclusion of both the cooks, digester pressures are relieved normally through eductors into high-pressure accumulators, then into low-pressure accumulators, and finally through heat exchangers and back to acid storage tanks. At zero pressure the pulp, along with second-stage spent liquor, is flushed out of the digesters with the aid of red liquor from the first-stage brownstock washer into four dump tanks.

From the dump tanks the stock is pumped to four washers. Each washer is single stage and the pulp is washed in turn over each of the four washers. At the end of the third stage the stock drops into a soak tank which is followed by four knotters and the fourth washer. A belt conveyor then carries the stock into high-density storage.

Diluted stock is later pumped to seven primary and two secondary Cowan screens. There are eight sections of 14-plate flat screens for handling the tailings from the Cowans. The accepted stock is then thickened on two vacuum deckers and sent to a low-density storage chest.

Five-Stage Bleaching

Coincidental to the adoption of two-stage cooking were the installation of chlorine dioxide and peroxide bleaching stages. The incorporation of these new stages into the present bleach plant was not wholly necessitated by two-stage cooking, but it was felt that their inclusion could better retain the advantageous characteristics attained in the pulping stages. The new stages allow complete flexibility of bleach sequences so as to use various stages to enhance the qualities of the pulps. The bleaching sequence is:

1. Chlorination
2. Caustic Extraction
3. Peroxide
4. Chlorine Dioxide
5. Hypochlorite

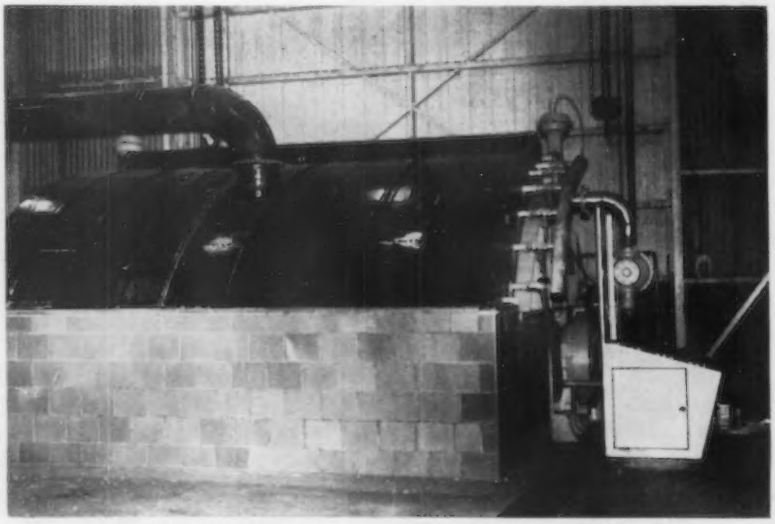
Weyerhaeuser is one of the probably very few sulphite mills to employ all of these types of bleaching stages. The original bleach plant was designed for C-E-H stages, utilizing a Hooker chlorine mixer and upflow chlorination tower, a downflow caustic extraction tower with Kamyr mixer, and eight sodium hypochlorite bleaching cells.

Peroxide bleach solution is prepared by continuous metering of sodium peroxide, hydrogen peroxide, sodium silicate and Epsom salts into a central tank. The resultant solution is mixed with the pulp in a pulp mixer.

For the new chlorine dioxide stage a new Impco-designed 20-foot diameter by 66-foot high downflow tower, complete with preretention tube, was installed. Total retention time in the ClO_2 stage can be up to 360 minutes. A new Impco 11½ by 16 foot vacuum washer with fiberglass hood, tile vat, and stainless steel repulping screw was also installed following the ClO_2 tower. After bleaching the pulp goes to high-density storage.

Chlorine dioxide is generated according to the Mathieson process in which sodium chlorate, sulphuric acid, sulphur dioxide and air are continuously metered into a reactor. The chlorine dioxide gas produced leaves the top and passes into a water-absorption system to form the bleaching solution which goes directly to the bleaching tower.

From the high-density storage the bleached pulp is pumped to the machine room where it is further cleaned in six Cowan screens (five primaries with one secondary followed by a flat tailings screen) and a



Washer following fourth-stage chlorine dioxide bleach tower has fiberglass hood and vapor exhaust duct, many stainless steel components.

four-stage Centricleaner system consisting of 900 bodies. The pulp is then thickened and sent to the machine chest. The pulp drying machine consists of a conventional fourdrinier followed by the longest Minton vacuum dryer ever built in this country which encloses fifty-two 60-inch diameter dryer rolls.

Liquor Recovery and Acid Making

Spent liquor recovered from the pulp washers is first concentrated to 50-55 per cent solids in a nine-body, six-effect evaporator. Following the evaporators are twin liquor-burning and raw acid-making systems. Each system consists of one B&W recovery furnace (designed for 850 p.s.i. operation with a rating of 114,000 lbs. of steam per hour) equipped with 16 burners, economizers and air preheaters; Multiclone; steel, tile-lined cooling tower; and three concrete tile-lined absorption towers. All towers are packed with cross-partitioned tile rings and it was not necessary to change this packing upon adoption of two-stage cooking.

The magnesium oxide removed from the Multiclones passes through a seal valve and is sluiced to a retention tank and thence to a washer. The washed ash is sluiced to two slaking tanks and heated with direct steam to 190 degrees F. for two hours. The resulting magnesium hydroxide is metered to the absorption towers after the furnace.

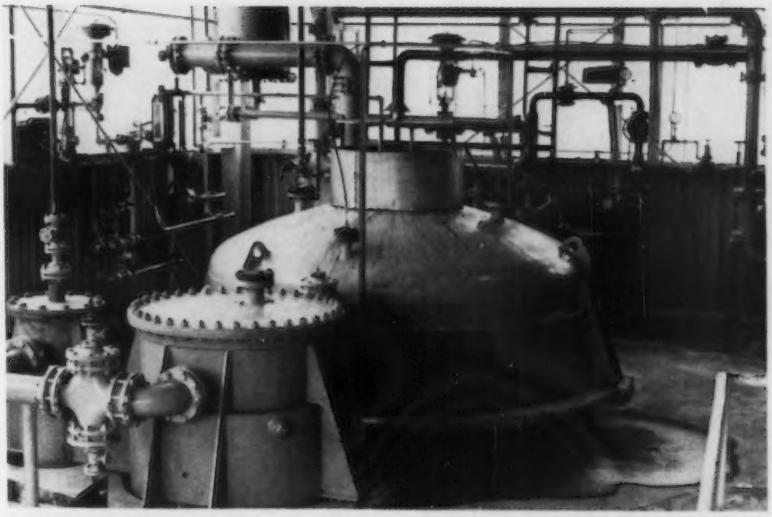
Flue gasses are fed in series through the three absorption towers. Each tower is equipped with a conical bottom supplying a circulating pump which feeds back to the top of the tower. Magnesium hydroxide slurry is fed into the inlet of each pump.

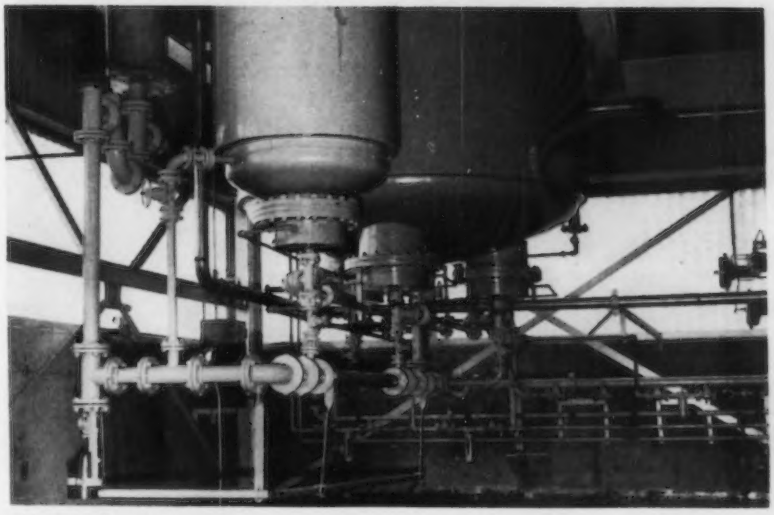
There is a gravity flow of the acid forward from the previous tower (counterflow to the gas) to the inlet of the circulating pump on the next tower. The percentage of combined SO_2 in the acid is maintained through a pH controller regulating magnesium hydroxide feed to the last tower. Raw acid from the first tower is sent to a wood-settling tank.

The acid fortification system consists of two Kimberly-Clark type Chemi-Pulp sulphur burners followed by direct contact spray coolers with primary and secondary units. In the standard MgO system, the sulphur dioxide gas, which is used to make up for sulphur losses in the system, strengthens the acid in a steel, tile-lined fortifying tower packed with cross-partitioned tile rings. Like the cooling and absorption towers, it was not necessary to repack this tower to handle two-stage cooking liquors.

When the FB (two-stage acid) cooking system is being employed, the raw acid from the absorption towers bypasses the tower and flows through gravity sand filters, thence to the acid storage tank. Second-stage acid is made up simply by absorbing SO_2 gas in a countercurrent flow of water in the tower.

In the HO (second-stage neutral) cooking liquor makeup, raw acid from the absorption towers also bypasses the fortifying tower and flows through the gravity sand filters, thence into acid storage and later, the high-pressure accumulators.





Chlorine dioxide bleach liquor is made up in Mathieson process reactor and absorption tower shown with maze of piping above, on top floor of bleachery (upper photo) and on second floor directly beneath (lower photo).

Ed. Note: FB and HO are Weyerhaeuser's designations for the two new pulps, sometimes referred to informally as two-stage acid and two-stage neutral, respectively.

Pulping Advantages

The key principles to the two new pulping methods have been summarized by Earl Bailey, former research man now assistant technical director at Grays Harbor, as follows: "In the FB pulping, the first stage stabilizes the hemicelluloses and the lignin is removed in the second stage with a minimum of hemicellulose removal. On the other hand, in HO type pulping, the first stage, a nearly conventional bisulphite cook, removes the lignin, while in the second stage, the hemicelluloses are removed to result in a pulp with high alpha content."

A particular advantage to the processes then is immediately evident. With the two different cooking

Russell LeRoux
Mgr. of Pulp & Paperboard Mfg.

Merrill Robison
Ass't to Mgr. of Mfg.

S. C. McKee
Longview Research Center

John R. Callahan
Resident Mgr. at Cosmopolis

John L. McClintock
Technical Director, Cosmopolis

Earl L. Bailey
Ass't Tech. Dir., Cosmopolis

stages the amount of pulping in each stage can be varied regarding cooking liquor conditions and time. Thus, Weyerhaeuser can produce these new pulps with unique properties that can only be imparted by the above-noted variables.

The long "cover-to-cover" pulping times in both processes are especially notable in light of conventional sulphite mill operation. The Cosmopolis mill probably is the first mill on the North American continent to employ such extended cooking times, with the exception of a very small number of mills producing special Mitscherlich pulps. In European sulphite mills, it is not uncommon to employ longer cooking times in efforts to produce premium pulps.

Weyerhaeuser points out that production of FB, HO and standard magnesium acid sulphite pulps cannot be done in a random manner. It is necessary to schedule production ahead of time, providing appropriate time to change over to another system. Much flexibility, however, is built into the mill by the two separate lines of liquor recovery, acid making and storage, plus the high- and low-pressure accumulator equipment.

Pulp Quality

At this time, Weyerhaeuser officials will not quote specific data on chemical and physical properties of the new pulps. Average values have had adequate time to stabilize due to the newness of the operations, it was said. However, a basis is provided for a general comparison of their quality with that of standard magnesium acid sulphite pulp manufactured in the same equipment at Cosmopolis.

The FB two-stage acid pulp has a 2-3 per cent higher bleached yield. It is, say Weyerhaeuser officials, probably a little more difficult to bleach, requiring slightly more chlorine when bleached to 93 G.E. brightness. Total screening losses are about the same.

On the other hand, the HO pulp has 2-3 per cent lower yield after bleaching to equivalent brightness. However, like FB pulp it bleaches as easily as the standard pulp but requires more chlorine.

In regard to consumption of chemicals and their recovery, Earl Bailey notes, "We don't anticipate any greater losses of chemicals, in proportion to the standard process, even though a higher total amount of chemicals is carried in the liquor." Through the recovery cycle it is realized that present liquor burning and chemical recovery systems are not overloaded since the extended cooking periods keep the total amount of solids to the furnaces balanced. Under two-stage pulping the solids in the spent liquor to be evaporated is equivalent to that of conventional magnesium acid sulphite pulping—by 2 to 3 per cent solids.

The FB (two-stage acid) pulp is a high brightness, good strength pulp for use in paper formulations which presently use an acid sulphite pulp. The significant advantage for this pulp over conventional pulp is the rapid hydration which is obtained for a given degree of refining power input. In the high freeness range, for a given degree of refining, the burst factor for this pulp is significantly higher than for acid sulphite. For example, when refining to an S-R freeness of 800 degrees, using a plug type refiner, the power requirements are 60 to 70 per cent of conventional acid sulphite, while the burst value is 30 per cent higher.

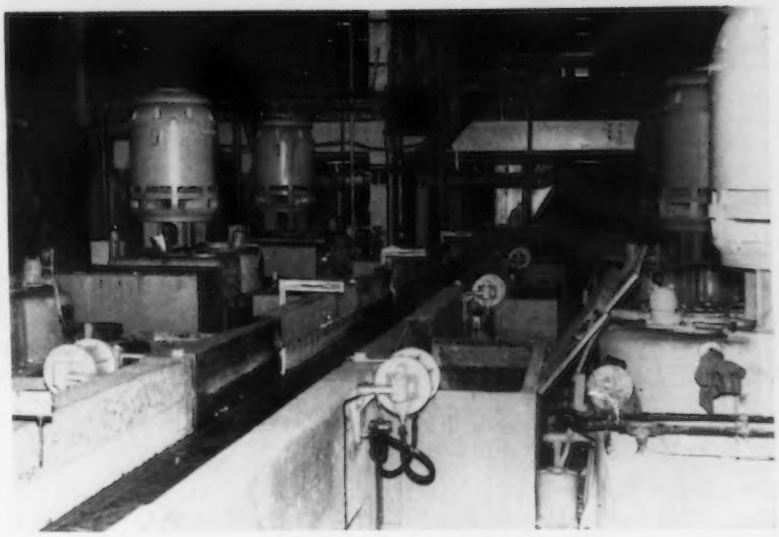
The rapid hydration characteristics are impaired to the pulp by a

high hemicellulose content.

This pulp is very well suited for those paper mills where sufficient refining capacity is a problem or wish to have higher burst properties in the high-freeness low-refining range.

The HO (second-stage neutral) pulp is a high brightness, high alpha type pulp suitable for substitution in formulations presently using acid sulphite or in some cases, kraft. This pulp has an alpha cellulose content of 89-91 per cent and may be suitable for some mills which presently require an alpha type pulp. Burst and tear values are much higher than the normal acid sulphite and alpha type pulps.

The opacity of HO pulps is expected to remain at a high level when beaten. This, in conjunction with the high burst and tear, makes it a desirable pulp for papermaking. In addition, this high strength is obtained while maintaining the good formation characteristics of sulphite pulps. The power requirements for refining are somewhat higher than for normal acid sulphite, however.



Central belt conveyor shown above distributes chlorine dioxide bleached pulp into eight sodium hypochlorite bleaching cells.

Plaudits

Credit for the development of the FB two-stage acid process using magnesium base liquors appropriately belongs to Weyerhaeuser's research department at Longview, and especially to Dr. **S. C. McKee,** whose name appears as inventor on the patent application for the process. More than two years were spent in the research and development before the commercial adoption of the process at Cosmopolis last spring.

The HO process was originally conceived and developed by **G. H. Tomlinson** at Howard Smith Paper Mills. Weyerhaeuser, through exchange of information agreements with Howard Smith and Babcock & Wilcox (all three hold patent rights to MgO pulping licensed by B&W), all three of whom cooperated on the research and development, adopted the HO process on a commercial scale last spring also.

Heading up the Pulp and Paperboard Division's pulp manufacturing, in addition to **Russ LeRoux,** is **Merrill Robison,** assistant to the manager of manufacturing, **Dr. J. D. Reagh,** research director, and **Al Graef,** technical assistant to manager. Primarily responsible for the production of the new pulps at the Grays Harbor branch and instrumental in their commercial development are **J. R. Callahan,** resident manager; **John L. McClintock, Sr.,** technical director; and **Earl L. Bailey,** assistant technical director

Behind each recovery furnace is a flue gas cooling tower (l.) followed by three countercurrent absorption towers where MgO solution absorbs SO_2 gas. Raw acid then goes to settling tank. As far as this point, system is alike for FB, HO, and conventional magnesium bisulphite liquor preparation, then it diverges as shown on flow chart.

Engineers Dissect High Velocity Dryers at Conference

Via technical papers and a panel session on high velocity dryers for coating, many interesting points on operation and problems with this often misunderstood equipment were brought out.

John C. W. Evans
and
Paul D. Van Derveer,
Paper Trade Journal

The Engineering Conference is annually one of TAPPI's best attended and most interesting meetings. Held this year in Washington from October 16 to 19, it was attended by nearly 800 representatives of the pulp and paper industry and its suppliers.

A large number of technical papers were given, many of them of immediate practical value, and others more theoretical in nature and quite possibly of future value. The conference theme was cost reduction through engineering and the areas covered ranged from sanitary engineering, corrosion and materials handling to such things as fluid mechanics and operations research. Below PAPER TRADE JOURNAL highlights some of the more important papers.

Air Hoods for Drying Coating

One of the features of the conference was a panel session on high performance hoods for coating drying moderated by S. G. Holt of Consolidated Water Power and Paper Co. Each panel member discussed his company's high velocity dryer installation on coating applications, operating experience and problems encountered. Panel members were: G. D. King of Crown Zellerbach Corp., West Linn, Ore.; G. W. Goelz, Jr., Blandin Paper Co., Grand Rapids, Minn.; and R. Johnson, Jr., Oxford Paper Co., Rumford, Me. Highlights from the reports given by these three men follow.

CROWN Z—MR. KING

We installed high velocity dryers on an on-machine coating set up. We put two high velocity dryers after the roll coaters and one each after two blade coaters. We did this because of extreme space limitations; it wasn't a simple case of moving out the end of the building, it was a case of the machine dry end changing the area of the sheet finishing room and supercalender department. So we elected to try to shorten the paper machine.

We ran mainly into a problem that is connected with the draws after the high velocity dryers and the ability to draw a sheet through them. This resulted in a variation in drying across the web and every on-machine coater that I have seen has this problem to some degree. Why we have it to a greater degree I don't know.

I would like to discuss some of the things we did to try to overcome this problem. Of course, we went through the complete area of can temperature versus air velocities, temperature, and steam on these various dryers.

We changed just about every kind of run that could be changed. We changed rolls, we changed covers on draw rolls. We put drives on every intermediate draw roll between each one of these dryers.

We then went to the wet end of the machine and completely changed the slice chamber. We installed a Formex on two of the dryers. We installed a dryer felt on two of the dryers and we tried just about every combination between.

BLANDIN PAPER—MR. GOELZ

Our No. 3 off-machine coater equipped with high velocity dryers was put into operation in May 1959 and is used to coat raw stock from our No. 3 paper machine, coating both sides of the sheet with approximately 12 lbs. of coating. The machine is designed for a speed of 3,000 f.p.m. with drying capacity provided for 2,500 f.p.m. The drying rate was calculated on the basis of applying 5 lbs. of coating per side per ream (25 X 38 — 500). We were calculating 50 per cent solids.

Today we are able to coat at drive speeds above 2,600 f.p.m. To secure this drive speed has been somewhat of an evolution during which both we and the manufacturer of this equipment were acquiring knowledge and experience, and not all of it was pleasant.

Our problem was to obtain the performance that both we and the manufacturer expected of the dryers.

The first dryer on our coater is wrapped with 180 degrees of high velocity nozzles. Following this dryer, the web passes a moisture sensing device which regulates the air dryer temperature of the first dryer. The sheet next goes into the second coater, then to the second dryer whose shroud is split into two sections, the first having 84 degrees of wrap, and the second section wrapping 144 degrees for a total of 228 degrees.

It then goes under another moisture sensing device which regulates air temperature only in the second (144° wrap) section. The first section is held constant. From that point the sheet goes to the reel.

The dryer cylinders have 157½ inch face and are 72 inches in di-

ameter with the nozzle section on the air dryers having a face width of 152 inches. The steam pressure in the dryer cylinders can be carried up to 30 p.s.i., but since we have found almost no contribution to drying from the cylinder the steam pressure is only carried high enough to prevent condensation on the dryer surface.

The air for the high velocity dryer is heated by direct fired propane gas at the inlet of the circulating fan. The air temperature is normally held at a maximum of 600 degrees Fahrenheit. The burners have a maximum heat release of 5,730,000 for the No. 1 burner; 3,000,000 B.T.U. per hour for the first or smaller section of the No. 2 dryer and 3,750,000 B.T.U. per hour for the 144° section of the shroud. The propane gas is delivered by tank truck and unloaded into a 12,000 gallon storage tank.

Principal Problems

During the early months of our operation our maximum coating speeds were less than 2,100 f.p.m. because of drying capacity.

The original design was based on a maximum air temperature of 600 degrees Fahrenheit. We found that we could run 1,700 f.p.m. and dry the paper easily with 300 degree air and at 2,200 f.p.m. we reached the limit of drying with 600 degree air.

This performance was inconsistent with what we and the manufacturer expected. We found that somewhere above 300 degrees we lost the drying temperatures of the steam heated cylinders. We did some theorizing that this came about because a layer of vapor was formed between the sheet and the dryer cylinder. This may be further agravated by pumping air under the sheet at the higher speeds. We could further prove this theory by the fact that we could not control sheet tension by regulating the roller on the dryer coater sectional electric drive. The sheet is apparently floating on a layer of vapor and air as it wraps the dryer. There is almost no condensation load in the cylinder.

In order to reach the required dryer rate all the drying must be done by the air dryers. It means that we increased the drying rate at least up to the minimum specifications originally set up.

The first step we took was to increase the gas drying capacity so that we could attain a temperature of 750 degrees F. Operating at temperatures up to 700 degrees produced a variable improvement in drying and it produced a great deal of trouble with warping and cracking in the nozzle section, due to bigger, faster, temperature changes. The temperature was then lowered to 600 degrees Fahrenheit and it has remained at that point ever since.

The next step was to increase the circulating tank capacity and open the nozzles up and raise the quantity of their flow. This change offered some improvement but not all we were looking for. During that time the manufacturer developed a better method of supporting the nozzles. Since ours were in very poor condition because of the high temperatures, it was decided to replace all the nozzles incorporating their improved design to allow for expansion without distortion.

Very careful attention was given to holding the clearances between the cylinders and the dryers to the very minimum tolerance. This was another small improvement and there remained but one more step to secure our present performance.

The edges of our sheet were running drier than the middle; it was necessary to control the drying to the dampest part of the sheet and we were therefore overdrying the edges, and thus wasting a portion of the drying capacity.

The manufacturer permanently characterized the dryers by closing off a calculated portion of the nozzles at the front and back edges. This procedure then leveled off the moisture profile across the machine and resulted in a higher allowable speed. With this arrangement we can and do operate above 2,600 f.p.m.

We have recently installed a laboratory pilot coater with high velocity dryer all designed for 4,000 f.p.m.

OXFORD PAPERS—MR. JOHNSON

Changes take place slowly because the drying of coating is not a simple matter. Several years ago we installed the North Star coater, an off-machine coater, which was arranged to use a 6 foot diameter dryer hooded by a Gardner high velocity unit following each of the blade coaters. Additional drying capacity in the form of standard five foot drums follows each of the Gardner units.

The six foot dryer drum was designed for steam pressures up to 50 p.s.i. and the high velocity heated air in the hood was reaching a nozzle velocity of 16,000 f.p.m. at a maximum temperature of 350 degrees F.

The choice of the Gardner unit was based upon its advertised success in the field, but the application was made with some conservatism. This equipment has been successful, but there have also been conditions beyond which the drying rate could not be increased while making a satisfactory product.

Our testing and considerable experience indicates that an evaporation rate of approximately 12 lbs. an hour can be obtained at speeds between 1,300 and 1,800 f.p.m. Coating formulas used have been for both letterpress and offset printing.

One area that we investigated with respect to the hood itself was in the reduction of air temperature below the maximum of 350 degrees. So what we did was to make some air velocity changes in the equipment.

The six foot dryer drum temperature has been reduced from the original level, corresopnding to 10-20 p.s.i. steam pressure, to the ambient temperature associated with heat transferred from the hood air.

In regard to cockling, evaluation of several examples combined with information from other users of this type of equipment would seem to indicate that the difficulty was encountered when extremely high rates of water removal were being obtained. Under these conditions the tendency of the sheet to cockle on the dryer surface will be accentuated.

Panel on high performance hoods for coating. S. G. Holt, moderator, Consolidated W. P. & P.; G. D. King, Crown Zellerbach; G. W. Goelz, Jr., Blandin Paper Co.; and R. Johnson, Jr., Oxford Paper Co.

Water Removal
By High Velocity Air Hoods

J. A. Means,
Time, Inc.
Springdale, Conn.

A number of high velocity drier hood installations were studied using a technique not requiring sheet samples. Drying rates on paper and coating were compared with velocities, temperatures and B.t.u. inputs.

To determine the performance of an air dryer, it is first necessary to determine and measure its pertinent characteristics. These studies, made in eight different mills, used data collected with readily portable equipment. The three basic measurements that must be made are air temperature, air velocity and moisture removed.

Sixteen high velocity air hoods were studied. Eight of these hoods were used for drying coating, and eight were drying paper.

Table I is a summary of the important characteristics of seven of the paper drying air hoods. Most of the quantities are on the basis of square foot of hood area per hour.

The column, Nozzle Velocity, gives the velocity of the air as it passes through the nozzle. The column, Velocity at Paper, gives the air velocity after its reduction due to traveling the clearance distance from the nozzle tip or edge to surface of the drum. The heat transfer efficiency is merely that percentage of the B.t.u.'s furnished that is required to evaporate the moisture indicated in the drying rate column.

The first six hoods show a drying rate responsive to temperature and air velocity increases. The first four are at approximately the same temperature, but show a marked increase in drying rate with an increasing velocity. Driers No. 5 and No. 6 show considerable rate increase over drier No. 4 with not a great increase in velocity, but a significant temperature increase. Drier No. 7 shows an excellent drying rate with a slightly higher temperature than No. 5 and No. 6, but with lower velocity, blower horsepower and B.t.u. input. There are two reasons for the high rate of No. 7: first, efficient design; second, proper location in the drier section. Drier No. 4 is in an equivalent position on a similar machine but is of a different design.

A 12 per cent velocity increase and a 20 per cent B.t.u. increase, accompanied by a slight reduction in blower horsepower, results in a 25 per cent increase in drying rate of No. 7 over No. 4. This is the result of good design. The other five hoods are all struggling under the handicap of being misplaced in the dryer sections, but being of similar design, they show an almost straight line relationship of velocity to drying rate.

Table II shows the eight coating drying hoods data summary. The data is handled in the same manner as the data in Table I. These coatings are all relatively light weight, comparable to those used on general publication grades.

At first glance, the Bt.u. inputs of coating driers No. 6, No. 7 and No. 8 seem to tie in with the drying rates, but the B.t.u. inputs of No. 2, No. 3, No. 4 and No. 5 do not follow any pattern. The volume increases, indicated by blower horsepower, accompanying the velocity increases account for the B.t.u. input increases.

Of the 16 hoods studied, only eight had nozzle velocities exceeding 10,000 f.p.m. Only these eight should be considered high velocity driers. Their drying rates are from twice to six times those of standard drum driers. Of the eight paper drying hoods studied, only two were properly located in the drier sections; and of these two, only one had a really effective design. Three of the coating driers are producing acceptable results and five are most definitely not remotely approaching respectable performance. Four installations, 25 per cent of those studied, have produced in accordance with the expectations of the purchasers. It is obvious that properly engineered installations of high velocity air hoods, properly operated, can be an effective tool for the papermaker to use.

High velocity air is not the answer to all drying problems. Heavy coat weights, coatings with low solids contents, and sheets with strength insufficient to withstand the impingement, are applications where high velocity air may very well prove unsatisfactory.

TABLE I. PAPER DRYING DATA SUMMARY

	Drying rate ft.²/hr.	Temp.	Nozzle velocity	Velocity at paper	Pounds air/ ft.²/hr.	B.t.u./ ft.²/hr.	Heat transfer efficiency	Blower hp./ft²
1.	3.7	312	8,980	3,000	410	27,650	14.7	1.37
2.	5.4	310	6,500	3,900	303	20,300	29.3	1.00
3.	6.0	310	7,300	4,400	328	22,000	30.0	1.12
4.	7.4	334	10,700	6,800	569	41,400	18.6	2.07
5.	12.3	520	12,400	7,450	445	52,500	25.8	1.93
6.	12.6	520	12,800	7,700	456	53,800	25.7	1.97
7.	18.7	595	10,900	7,600	364	49,700	41.4	1.89

TABLE II. COATING DRYING DATA SUMMARY

	Drying rate	Temp.	Nozzle velocity	Velocity at paper	Pounds air/ ft.²/hr.	B.t.u./ ft.²/hr.	Heat transfer efficiency	Blower hp./ft.³
1.	1.4	280	1,600	600	631	37,800	4.1	2.08
2.	2.5	485	2,700	1800	200	22,100	12.4	0.85
3.	3.4	260	5,900	4000	395	21,700	17.2	1.26
4.	4.4	600	6,600	4600	217	30,000	16.1	1.14
5.	7.0	415	7,300	4900	389	36,200	19.8	1.57
6.	10.9	610	10,700	7100	559	77,400	21.3	2.93
7.	16.8	595	13,400	8900	680	94,300	26.5	3.57
8.	18.4	605	13,900	9300	725	101,000	28.7	3.81

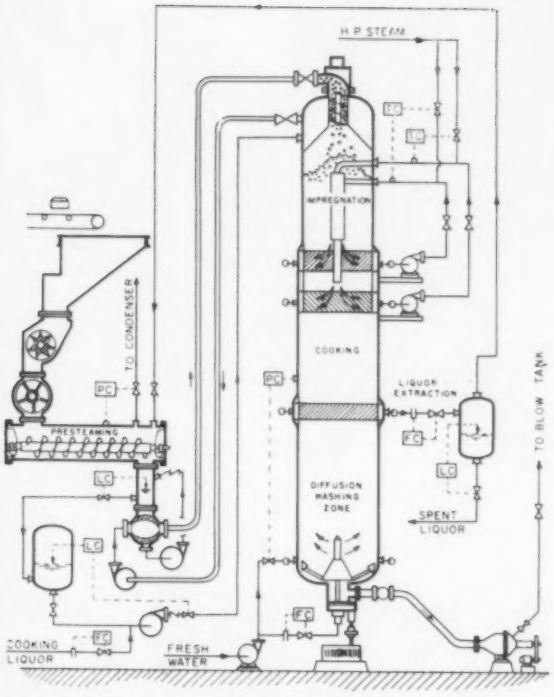


FIGURE 1. Kamyr continuous digester for high grade kraft with diffusion washing.

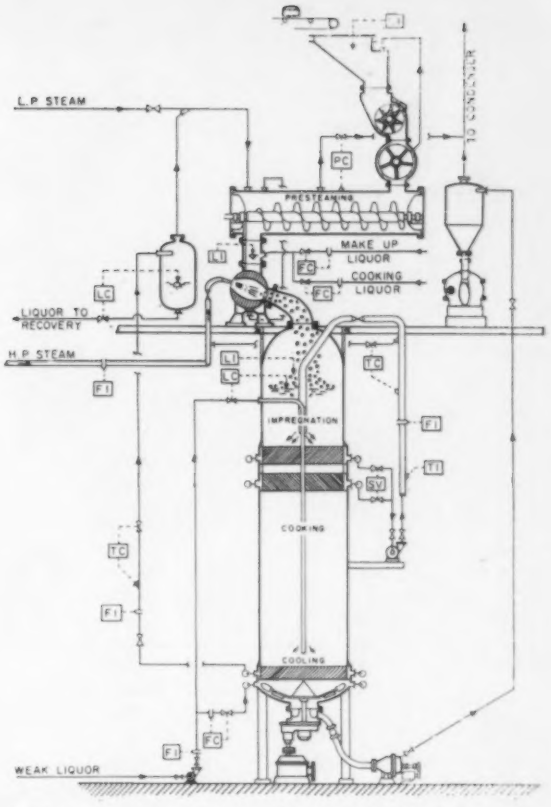


FIGURE 2. Kamyr continuous digester simplified for liner board.

New Developments in Kamyr Continuous Digesters

Norman Baldwin,
Kamyr, Inc.

Kamyr has developed several new different types of continuous cooking systems. One of the recent innovations that has been added to the standard top quality units is diffusion washing performed within the digester shell. Figure 1 shows a flow diagram of a unit which incorporates essentially all the basic requirements for top quality cooking, and in addition we have extended the bottom zone of the digester in order to provide counter-current diffusion washing by injecting fresh water directly into the bottom of the unit. When producing pulp suitable for linerboard or similar grades of pulps, the demands on the cooking process can be relaxed and the mechanical arrangement of the equipment simplified with a resulting reduction in initial capital investment.

Figure 2 is a flow diagram illustrating the principles of the system. It still retains the chip metering system and the preconditioning steaming vessel.

The basic difference in this system as compared to the top quality equipment is that the pressure impregnation zone in the vessel has been deleted. Thus the top portion of the digester is a vapor phase, and a simplified type of feeding equipment is used with high pressure steam becoming the power source for transferring the chips from the presteamer to the cooking vessel. The high pressure feeder is still a balanced feeder consisting of a pocketed plug rotating in a stationary housing. In the vertical position the plug fills with chips and cooking liquor, and in the horizontal position steam blows the material into the shell.

Although designed to handle regular mill chips, this simplified type of unit is also ideal for handling sawmill wastes and fractionated wood, such as pin chips. We still retain in the vessel adequate impregnation time, although in this case the impregnation does take place at temperatures in the neighborhood of 290°F.

Since the impregnation is at a higher temperature, only a single heat system is required to bring the material up to cooking temperature. Cooling at the discharge is still achieved by the use of a diffusion-extraction system and weak liquor from the washers. An interesting point in the design of a system such as this is that all the machinery can be supported from a platform which is attached to the digester, thus minimizing building requirements.

It is essential to the strength of kraft pulp that the material not be mechanically damaged during any part of the cooking cycle. When cooking is carried out with the acid processes such as bisulphite or acid sulphite, this degrading effect is still more pronounced. For this reason when top quality sulphite pulp is required, we use a unit that is quite similar to Figure 1. The major differences between the two systems

are that the metallurgy must be upgraded in order to handle the sulphite liquors, and a higher hydraulic pressure must be maintained on the shell so that there are no problems in keeping the free SO_2 in solution.

Such a unit is now being placed into operation in Europe.

The Modern Horizontal Continuous Digester

William Herbert,
Chief Engineer, The Black-Clawson Co.,
Pandia Division, Middletown, Ohio

The various mechanisms which comprise a modern continuous digester of the horizontal type were described. Various means of metering and feeding the digester are presented. Recent improvements in design of screw feeders and rotary valve feeders were discussed and illustrated. The author explained how the digester proper functions, including means employed to obtain high rates of recirculation of cooking liquor. Design improvements in rotating impeller dischargers were shown, and the application of rotary valves and screw presses as discharge mechanisms discussed.

Screw Feeder

The modern design screw feeder, shown in Fig. 1, incorporates a number of significant improvements. These design improvements provide the following results: (1) minimum damage to the chips, (2) reduced incidence of blowbacks, and (3) reduced maintenance cost.

In the earlier design of screw feeders the only concern was to build a piece of equipment that was sufficiently rugged to force the chips into the pressure zone of the digester. As the chips were compressed in the screw and forced into the plug pipe, there was a great deal of chip-to-chip relative movement. On many types of woods, and particularly the softwoods, the chips were fractured and the quality of the pulp produced was impaired. In the modern design screw feeder the lead of the screw and the taper on the o.d. and root diameter are designed such that chips are compressed uniformly in all directions and chip-to-chip relative motion held to an absolute minimum. Note that the root of the screw carries through the plug pipe, thus eliminating the necessity of collapsing the hollow core that would normally be extruded. It is in the formation of the solid plug that most of the chip damage occurred in the older design screw feeders.

The extension of the root of the screw through the plug pipe is one of the principal reasons for reduced blowbacks in the new screw feeders. When a solid plug was formed, the core of the plug was always soft. Blowbacks generally started at this weak point.

The feed screw is now rigidly supported at the drive end. The drive shaft extends through the hollow screw sections and is fastened by a special stud at the tip end of the screw. The extended root of the screw acts as an outboard bearing in the plug pipe. Thus the screw is now supported at both ends. This eliminates the wear that resulted from the old, loose screw rubbing on one side against the tapered throat. The screw and the throat are now made of hardened ductile iron, which provides excellent abrasion resistance. The screw itself is now made in two sections so that only the tip end need be replaced or repaired.

We now produce four separate designs of screw feeders, each particularly suitable for the intended application. These are: (1) wood chip screw feeder, (2) agricultural fiber screw feeder, (3) petro-diffusion system screw feeder, and (4) chemipress screw feeder for cold soda.

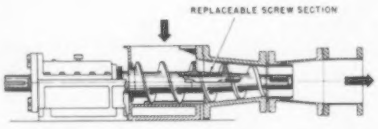


FIGURE 1. Screw feeder

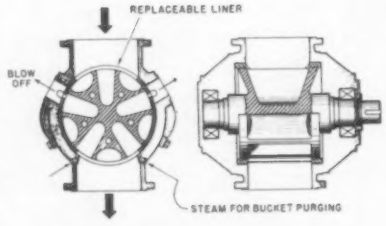


FIGURE 2. Rotary valve feeder

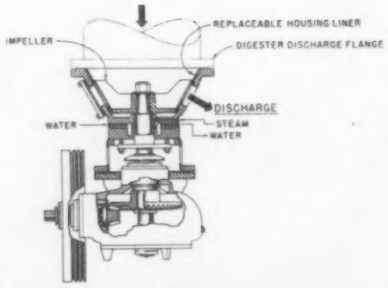


FIGURE 3. Pandia discharger with spiral bevel gear drive

Rotary Valve Feeder

For high-quality pulps and, particularly, for pulps made from softwoods, a feeding device other than a screw feeder is indicated. For these applications we recommend the use of a rotary valve feeder (Figure 2). The valve operates on the same principle as the star feeder. However, a valve which will operate successfully against a pressure differential of 150 p.s.i. or greater, must incorporate many design details not required of the low pressure star feeder. There will be expansion due to heat, and deflection due to the high pressures, and these must be handled in such a way that only a few thousandths of an inch of running clearance is maintained. In the design shown here the sides of the rotor are tapered in toward the center line so that the bearings are as close together as practicable.

Digester Discharge Mechanisms

Three distinct types of equipment are used as discharge mechanisms. The first, and most commonly used, is the rotating impeller discharger with adjustable orifice (Figure 3). This type of discharger has been used successfully for many years. Shown here is the new design which was brought out just this past year. It incorporates a replaceable wear liner in the discharger housing and an integral drive. The integral drive eliminates the problems previously associated with expansion and contraction of the digester tubes due to the temperature changes.

For the production of high test, low yield pulps, a rotary valve is used. The design is identical with that mentioned above for a rotary valve feeder.

Materials handling session. B. C. Kendall, chairman, Crown Zellerbach; M. W. Burke, Crown Zellerbach; J. A. Holekamp, American Pulpwood Ass'n.; and J. R. Girardeau, Brunswick Pulp and Paper Co.

Fluid mechanics. P. E. Wrist, Mead; S. T. Han, Institute of Paper Chemistry; H. Meyer, Mead; R. E. White and W. E. Marceau, Villanova U.; J. W. Daily, Massachusetts Institute of Technology.

Wood Storage and Handling in Mills

J. R. Girardeau,
Brunswick Pulp and Paper Co.,
Brunswick, Ga.

A close working relationship between the woods division and woodyard of a company is essential. Working as a team, these two departments can play a major role in determining the cost and quality of the finished product. The proper selection and training of personnel is a determining factor in the degree of efficiency obtained in carrying out established programs.

Wood handling methods should be designed for maximum efficiency, based on the programs of wood procurement and mill operations. Retention time of trucks in mill yard affects the profit of producers, which in turn is reflected in cost of wood delivered to plant.

Selection of yard equipment, designed for minimum delays in changing from a sling to bucket operation, is vital. Major savings can be realized by minimizing the amount of wood handled from storage. Selection of a method to determine accurately the inventory of wood on hand is necessary to control the movement of inbound wood and to determine mill usage.

New Roll-Less Flo-Vac on a Fourdrinier

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Covington, Va.

The development of the roll-less Flo-Vac and its installation on a fourdrinier manufacturing semi-chemical corrugating medium were described. Results of the installation were presented.

A program was initiated in 1959 to investigate the feasibility of operating a Flo-Vac unit without rolls. The rolls were removed and semi-circular guides were substituted. Lubrication of these guides was found to be unnecessary. The original suction box was then lengthened so that it extended from one guide to the other. Due to the increased length of the box, the open channel lubrication system was found to be unsatisfactory. This led to the design of the multiple port system which supplies a maximum of lubricating water in a uniform manner. In this system water is supplied through headers in the nose pieces, and introduced into enclosed channels in the vacuum box which feeds ports located between blanket and box. With the multiple port system it was found that the belt on the roll-less unit would start when the box vacuum reached 1½ inches of mercury.

To minimize further drag between belt and box the belt was run at low tension. To reduce the ballooning tendencies of the blanket in the machine direction, caused by centrifugal force, circumferential reinforcing of the rubber with a ply of nylon cord was added.

Unit Installed

A 25 by 170 inch, Type A, single vacuum unit was ordered to replace the three dry end suction boxes. The all stainless box has permanent deckles, and the four 1½ inch lubrication water inlets are located in the nose pieces. Four angle belt members are added to the fourdrinier and some of the return rolls are remounted. The Flo-Vac cover plate having an open area of 65 per cent contains 1134 equally spaced vacuum ports of ⅞ inch diameter.

At the outset two major problems were encountered in operation of the roll-less unit. Continual tracking of the belt to the tending side existed, as well as erratic tracking on starting and stopping of the Flo-Vac. This also produced erratic wire guiding. Repositioning of the box relative to wire travel by means of the tending side jack screws had little effect in stabilizing the belt tracking. Because of the instability

of tracking, the wire was severely damaged two days following the original startup. The unit was removed and the suction boxes reinstalled.

Problem Analyzed

In analyzing the problem it was determined that two sources of error may have been the cause of the poor belt tracking, nonuniform lubrication or nonuniformities existing in the rubber blanket. Data collected following Flo-Vac removal indicated that lubricating water introduced to the front and back side of the unit was not of uniform pressure or volume, and the outside belt circumference was nonuniform.

The roll-less unit was reinstalled on our No. 6 machine in October, after water of uniform pressure was made available and flow measuring orifice plates installed at all four points of introduction. To compensate for the irregularities existing in the blanket, and decrease the ballooning tendency of the belt at the machine operating speeds, a stainless steel pan was installed between the underside of the vacuum chamber and the belt. It was made to conform to the normal belt catenary and bolted to the underside of the vacuum box so as to create equal belt tension front and back without creating excessive drag. With these changes satisfactory belt tracking and vacuum hole register were accomplished with only minor jack screw adjustments, and the erratic tracking during load changes was eliminated.

One operating problem with the roll-less Flo-Vac has yet to be answered. The original belt was removed after five months of operation because of excessive edge cracking and erosion of the land area in the plane of the vacuum holes. The edge cracking undoubtedly was the result of the abuse given the blanket during the period of unstable tracking; however, the second belt shows the same erosion pattern as the first. This particular wear pattern has been common with all rotary suction box blankets, although the rate of wear has been less on other units.

Results Obtained

The results of improved wire life on No. 6 machine from installation of the roll-less Flo-Vac to date have amounted to a 15 per cent increase over the former 11-day average. The majority of the wires are still being removed because of damage caused by stock and shower water. Data collected indicates wire wear has been reduced 45 to 50 per cent since installation of the Flo-Vac.

With the installation of the Flo-Vac an increase in overall machine speed has resulted in a potential 3 to 4 per cent increase in machine production. The increased speed is believed to be the result of the ability to operate steam showers over the high Flo-Vac vacuum area. Formerly steam showers were operated over the number four and six suction boxes.

A reduction in couch load of 30 per cent has been realized. No couch load problem has ever existed on No. 6 machine; however, this reduction in load has resulted in minor horsepower savings as well as further indicating that a marked improvement in wire life is potentially available.

Serious consideration is presently being given to the installation of a second unit on this machine to replace the remaining suction boxes; although it is difficult to predict a return on investment on this second unit. Consideration is also being given to the purchase and installation of a roll-less unit for a bleached board machine to improve quality where water removal is at present a bottleneck.

Theoretical Considerations Of Vortex Separators

J. D. Boadway,
Chief Engineering—Physics Section,
Consolidated Paper Corp. Ltd.,
Grand Mere, Quebec

The theoretical understanding of vortex separators given in this paper was achieved during the development program which led to several designs commercially available at the present time.

One is the Vorvac separator which can be used for removing oversized particles and gas simultaneously. A second device which has been developed is the cleaner known as the Vorject. These units are finding extensive use in the paper industry and are available in different sizes.

Another device which has been given the trademark, Foamjector. This is designed primarily for a highly efficient stripping of foam and gases from fluids and the concentration and removal of material which floats or concentrates in foam.

Another device is known as the Foamtrap with which it is possible to remove a larger proportion of dissolved gases in fluid than is possible with the other devices. The Foamtrap is also more suitable where it is unnecessary to reject foam but is sufficient to remove gas and allow gas bubbles to break by themselves.

Design and Mechanical Application Of Formex Fabric

J. R. Wagner
Formex Co.
J. W. Sherrer and W. R. Given
Huyck Equipment Co.

Development of Formex fabric as a substitute for bronze fourdrinier wire was outlined by the authors. The bulk of this paper covered developments already reported to our readers, most notably, the new fabric and the greatly simplified modification required of the fourdrinier, as reported in the May 22, 1961, issue of PAPER TRADE JOURNAL.

The paper did report briefly on three new developments not previously revealed, but which the editors of this magazine have been following closely. These are: A Quick-Clothe Method; Use of Formex Fabric to replace dryer felts; and use of a heavier fabric (called Power Fabric) inside the fourdrinier forming fabric to absorb wear.

Quick-Clothe Installations

The Quick-Clothe method (Figure 1) offers a way of converting old and designing new fourdriniers to take advantage of Formex Fabric's flexibility and capacity for withstanding abusive physical handling. Unlike metallic wires, Formex Fabric may

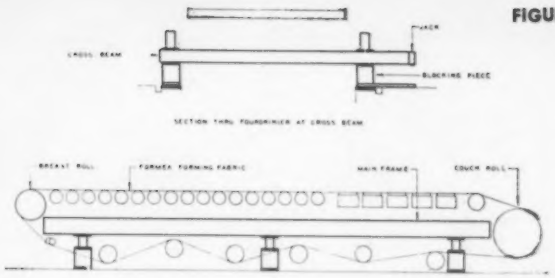
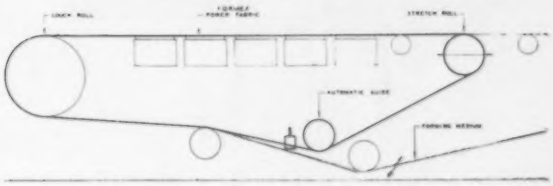


FIGURE 1. Quick-Clothe installation

FIGURE 2. Former Power-Fabric installation



be draped in a roped and dry condition, and considerable simplification of clothing procedure becomes possible. By this Quick-Clothe method draping time and labor requirements may be substantially reduced. Simultaneously the possibility of damaging machine elements through mishandling and the chance of accidental damage to the Formex Fabric in the course of installation are minimized.

To accomplish this modification, appropriate structural members are added to the fourdrinier and some of the return rolls are remounted. The Formex forming fabric may then be installed by removing essentially only tending-side blocking-pieces to create a clear passage through which the fabric may pass. Structural elements include main frames, cross-beams, removable blocking-pieces and hydraulic or screw jacks. With this equipment suitably arranged, the machine is clothed by: (1) Stringing the fabric in a roped condition in the tending aisle around the extended cross beams, (2) transferring the tending side load from the blocking pieces to the jacks, (3) removing the blocking pieces, (4) carrying the fabric to the machine proper, (5) replacing the blocking pieces, and (6) retracting the jacks.

Power Fabric on Fourdrinier

The Power-Fabric development (Figure 2) is aimed at minimizing the wear and physical distortion that forming media experience. The Power-Fabric runs inside the forming medium and is of tough, durable construction. Its path of travel may be identical with that of the outer membrane except for a departure during which it passes over its own auto-guide and tensioning rolls. Alternately it may be considerably shorter, passing only over the suction box area of the table, around the couch roll, and returning over guiding and tensioning rolls. In either case power is transmitted from the couch roll to the Power-Fabric and thence over a large surface area to the forming medium. The latter is towed smoothly, without concentrated stress, and suffers none of the abuse normally encountered at the suction box area.

The conversion for a Power-Fabric installation is achieved with straightforward conventional elements—return rolls, an automatic guide, and stretch positions. The automatic guide controls the lateral travel of the Power-Fabric independent of the forming medium and the stretch mechanism provides sufficient slack for installing the Power-Fabric and permits adjustment of operating tension. Generally this equipment can be introduced on a fourdrinier with a minimum of rearrangement and alteration of existing machinery.

Formex Fabric for Dryer Felts

The latest application of Formex fabrics to the paper machine has been in the dryer section. For this application, the high open area permits moisture to escape from the paper sheet more readily and uniformly across the entire width. The application of this fabric has resulted in five to ten per cent increased production on grades ranging from newsprint to pulp. In cases where machines are already running at top speed, this increased drying capacity could result in savings in steam cost. This fabric is equipped with a metal clipper seam and is installed in the same manner as a conventional drier felt.

Heat Recovery In Bleacheries

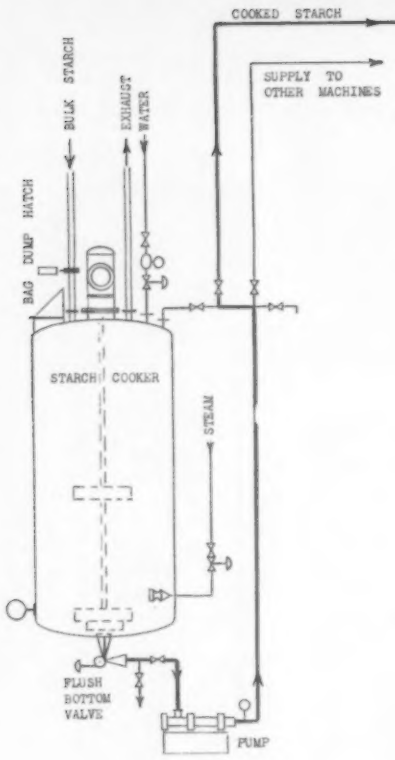
Nils O. Alm,
AB Separator,
Lund, Sweden—The De Laval Co.

In Scandinavia heat recovery in bleacheries has become very common. An investigation of experience has been made in 15 bleacheries to study the different factors that have to be taken into consideration for the construction of the ideal heat recovery system and to choose the most suitable heat exchanger for this purpose. Calories saved, calculated also as fuel oil, and experiences regarding choice of material, frequencies of cleaning, flexibility, etc., were reported.

The first heat recovery installations were installed at a time when recirculation of the white water came into general use, to begin with in the alkali stage of high-alpha-cellulose bleacheries. Since these stages operate at high temperatures, a lot of heat could be recovered by relatively simple means. The design of the recovery plant depends, naturally, on the nature of other secondary sources of heat supply. Today it is customary to recover the white water of the ClO_2, alkali, and sometimes too of the low and high consistency hypochlorite stages.

Plant	Heat recovered, M cal./hr.	Heat surface m^2.	Fuel oil saved* T./8000 hr.	Cost of heat exchanger per ton of oil saved $/Short ton
A	15,330	397	13,450	2:88
B	15,750	410	13,840	2:90
C	19,570	1180	17,200	5:15
D	3,360	276	2,960	8:10
E	....	254	....	....
F	6,430	282	5,680	3:90
G	8,980	623	7,920	6:—
H	20,330	1821	17,900	8:40
I	....	197	....	....
J	3,315	130	2,880	1:85
K	1,936	99	1,760	4:07
L	7,740	488	6,800	5:35
M	8,300	830	7,280	8:60
O	6,930	170	6,080	7:—
P	1,500	200	1,240	15:—

* Metric tons.



◄ **FLOW DIAGRAM of a typical size press makeup system shows cooker supplying any number of machines. Additional cookers in centralized area can be operated in parallel. Solution is batch pumped to holdup tanks at machines.**

AT THIS SIZE PRESS the holdup tank maintains constant level in circulating tank. Solution is supplied to size press through filter, and over-flowed back to circulating tank through inlet strainer. Hot water is piped for alternate use at size press with the overflow piped alternately to drain. Simple tie in connections makes it possible to by-pass holdup tank, circulating tank or filter during washup operations or grade changes. ►

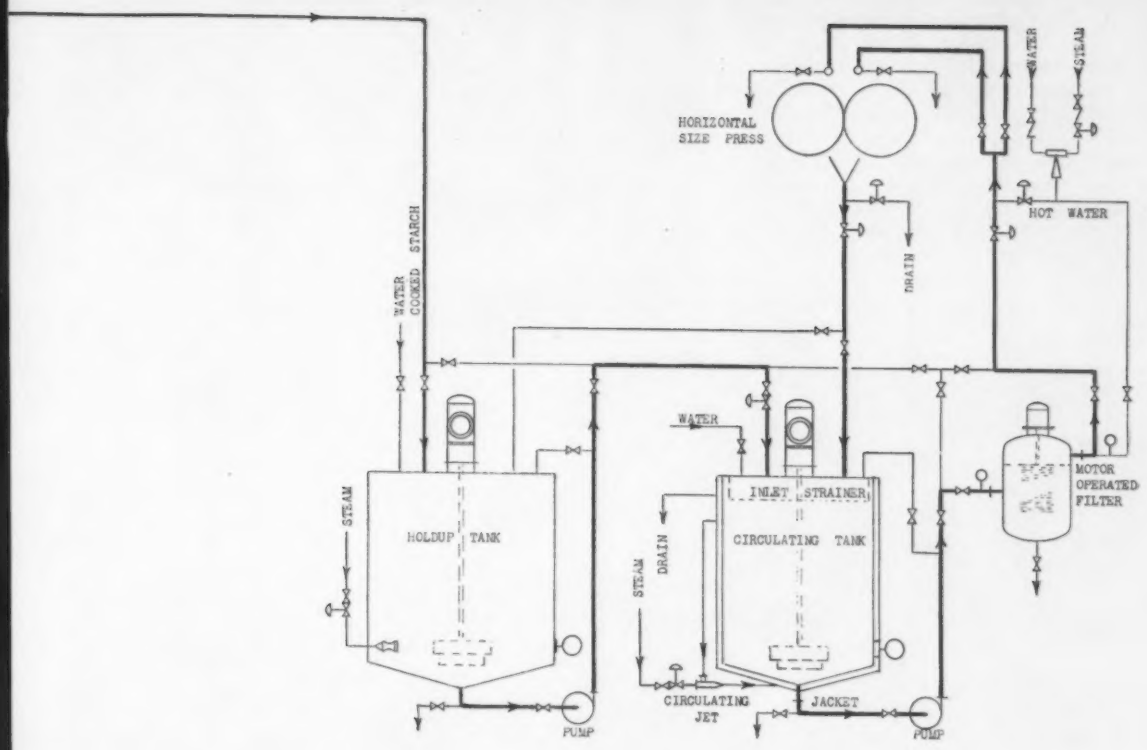
Automation Gives Size Preparation Flexibility With Positive Control

What are the design considerations and controls necessary to maintain quality and uniformity in today's size preparation system? An expert in this field provides detailed recommendations below.

William G. Farin,
Chemical Materials Handling Engineer,
Neenah, Wis.

Surface sizing at the size press for paper or board machines is intended to increase strength, hardness and water resistance; improve erasing and working properties; enhance resistance to ink penetration and picking and reduce the porosity of paper. Normally a modified (thin boiling) starch is the main ingredient because its low viscosity permits good absorption. The starch may be produced from potatoes, roots, grains or seeds such as corn, rice or wheat. Modified starches may be purchased to exact specifications controlled by the supplier or common base starches may be purchased at considerable savings and modified if required in the cooking cycle. Other ingredients used may include clay, titanium dioxide, wax, soap, various sizing materials, etc. depending on desired surface characteristics.

In cases where size press requirements are fairly constant, it may be possible to use a continuous cooker. However, such a cooker lacks the versatility that can be obtained from a batch makeup system. Where quantities warrant it, the batch system



may be automated to the point where it requires a minimum of manpower and yet provides positive control of makeup operations.

Starch Cooker

For batch preparation, the entire procedure can take place in a single cooker or a number of cookers sized to handle production requirements. The cooker can be of stainless construction to prevent contamination, or may have to be of a special alloy if an acid modification is to be used in the cooking cycle. It is provided with a bag dump hatch in addition to any bulk facilities and an exhaust to carry any dusting to a dust collector scrubber. The tank and agitator are designed to take a batch of starch at a reduced level through the cooking cycle in which the starch particles swell and thicken, requiring fairly high horsepower and finally rupture, reducing the viscosity. The freeboard is used to allow for dilution and reduction of temperature to operating requirements before pumping to the holdup tank.

To keep the time of the cooking cycle at a minimum, the cooker is provided with a large volume water metering system and a temperature controlled steam inlet system with spargers of a capacity sufficient to bring a batch up to temperature within ten minutes. The outlet at the bottom of the cooker has a flush bottom valve to eliminate any unmixed or uncooked starch from being produced in the outlet of the cooker.

If the cooker is fairly remote from the holdup or storage tank and solution with high solids is required, a constant displacement pump may be necessary. Again the batch time may be held down by providing a fairly high capacity pump. Where starch is bulk handled, the design capacity is sufficient to empty the cooker in the time it takes to refill a weigh hopper of starch as the two will be done simultaneously.

Automation of Cooking

Because this is ordinarily a time consuming, high capacity operation, it is a perfect application for an automated process. Proper controls can maintain quality and uniformity while relieving manpower of an otherwise full time operation.

For automation of the cooking operation the first requirement is a water meter with both primary and secondary controls having indicators to set the gallons required, resets for zeroing, and start and stop buttons. There are automatic-off-on buttons with indicator lights on the agitator, flush bottom valve and discharge pump. Cooker level is indicated and temperature recorded and controlled either by hand or automatically in a preset timing cycle. Hand-automatic switches are required on the initial heating and timing cycle to insure proper cooking of modified starch. If the cycle is to include enzyme or acid modification, secondary temperature and time sets are included in the timing cycle. In addition, an automatic dump bottom is desired to set up the automatic cycle, particularly when it is tied in with automatic starch conveying and weighing as discussed in the previous article. In this article the graphic panel for the entire automated conveying and cooking operation was shown.

Automatic Cooking Cycle

In this case, the operator having tested his completed batch of starch can have all controls on automatic; water, temperature and timing set up for the next batch. He then starts the completed batch on its way to the

holdup tank by pushing the start dump button. The flush bottom valve opens and the pump starts and the operator can immediately set the weight of his next batch of starch, start the weighing cycle and select the cooker now dumping to be refilled. The automatic cycle will complete the dumping and when the cooker is empty, will close the valve and stop the pump, thus protecting the constant displacement pump from possible damage due to running dry. When the valve closes, it actuates the primary water reset and starts the supply of water. When the starch weighing is complete, emptying the hopper into the cooker will follow provided the primary water flow has started. The agitator will go on to provide necessary mixing.

If the initial heating is on hand, it permits the operator to add any other ingredients before cooking at his convenience. On automatic, the steam flow starts when the weigh hopper is empty bringing the cooker up to temperature. Again a hand switch on the timing cycle can be used if any additions such as enzymes are necessary before timing. On automatic, the timing starts when the set temperature is reached and runs through the complete timing heating cycle. It then shuts off the steam and waits for the operator who has had at least 30 minutes of free time to handle other operations in the case of modified starch cooking or even longer in the case of a full conversion cycle.

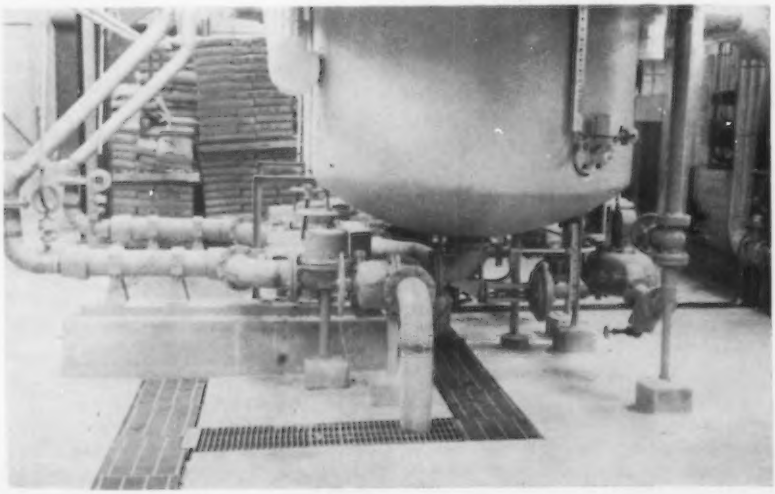
Secondary water and other ingredients may be added by the operator and a check made on the solids concentration before pushing the start dump button starting the cycle over again. The automation provides the chemical operator with an operation similar to his wife's automatic washing machine and he will prize its performance just as highly. However, unlike the washing machine, the on-off-automatic switches always allow manual operation even if trouble develops in the automatic circuit.

VIEW OF DUAL 2,000 gallon size press cookers supplied by bulk system from above or through dump hatch. Above the hatches are 15 h.p. agitator drives. Below, the constant displacement pumps discharge prepared solution to holdup tanks at machine.

Pumping and Piping to the Size Press

Even though the cooker may not be in the area of starch supply, there is no problem in pumping the cooked starch fairly long distances to a size press holdup tank in the size press area. The holdup tank should have at least double the cooker capacity and have a level indication at the cooker gage board to enable the preparation man to watch size press requirements. The holdup tank needs an agitator designed to maintain a uniform product and a temperature controlled steam sparger inlet system to bring up and hold at the desired operating temperature.

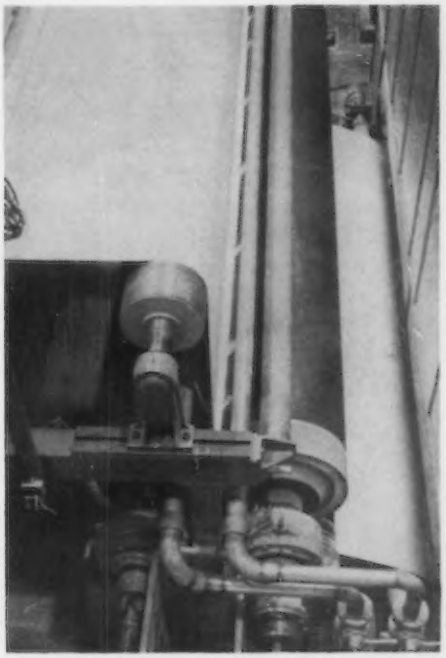
From the holdup tank the size press solution is pumped and maintains the set level on the size press



SIDE VIEW OF COOKERS shows remote operated flush bottom valve, water supply meter at right, diaphragm level indicator and steam inlet. Constant displacement pumps are protected by pressure switches at discharge.

◄ **IN THIS APPLICATION two circulating tanks have been provided below the size press to facilitate grade changes. The third tank to the right provides holdup capacity. Product is circulated by centrifugal pump with centrifugal seals. Steam supply to jet circulating hot water in jacket of circulating tank is seen in foreground.**

PLATFORM VIEW of size press circulating tanks and agitators and motor operated disk type filters with hot water back flush piping.



SOLUTION IS APPLIED on horizontal size press from dual headers coating both sides of paper. Flow distribution across the press can be seen. Excess solution overflows on both sides returning to circulating tank.

circulating tank. The circulation tank can be jacketed with hot water to maintain operating temperature without the dilution obtained by direct steam injection. The steam used for heating passes through a jet which circulates the heated water through the jacket. All material entering the tank, including new and circulated solution, passes through an inlet strainer which is easily checked and removed for cleaning through the manhole.

Pumping from holdup tank or circulating tank can be with centrifugal pumps, preferably with centrifugal seals to eliminate the possibility of shaft leakage while the pump is operated. Constant displacement pumps may be necessary if extremely high solids or high viscosities are involved. Solution pumped from the circulating tank goes through a filter equipped with a continuous mechanical cleaner and piped for periodic back flushing with hot water. The solution flow can be hand controlled at the size press to both sides of the paper and the overflow circulated back through the inlet strainer to the circulating tank. Alternate piping of hot water to the size press is needed for breaks with an overflow connection to drain. Using common supply and overflow headers automatically takes care of washup of the headers on every break.

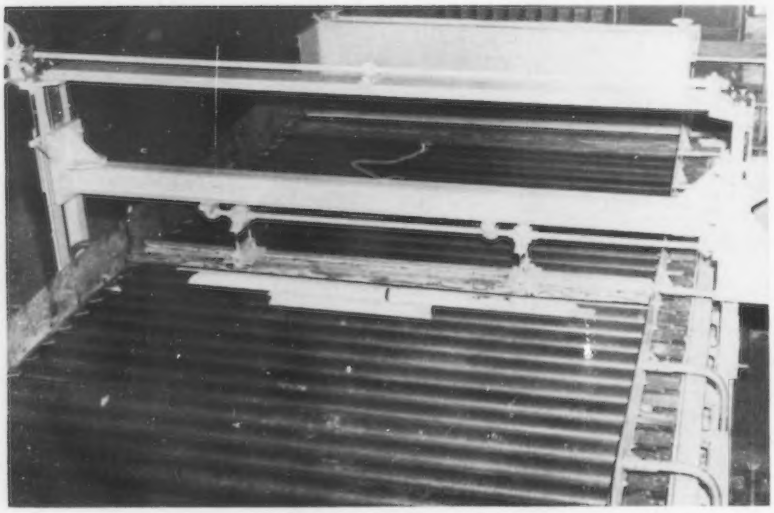
Control at Size Press

For control at the size press the operator has a holdup tank level indicator on his panel, indicating the same level the makeup man has at his board to determine requirements. The circulating tank level is indicated and controlled from the holdup tank supply. Temperatures on both tanks are indicated and controlled. There are start-stop buttons and indicator lights on both tank agitators, pumps and on the motor operated filter. A selector switch on the panel is provided to supply (coating-hot water-off) to the size press and on the overflow to (recirculate-drain). Except at a break when the selector switches are changed, the equipment at the size press is self-operating once set up for operation.

Although only one size press circulating tank is shown in the flow diagram, a second one may be desirable where quick grade changes are made on the paper machine. The second circulating tank can be ready to go at grade change and the first cleaned up after the switch over is made. It also provides spare pumps and filters and can be used, if required, as an auxiliary holdup tank. With one circulating tank, the holdup tank can serve as an emergency or auxiliary circulating tank with the minimum of additional piping shown in the flow diagram.

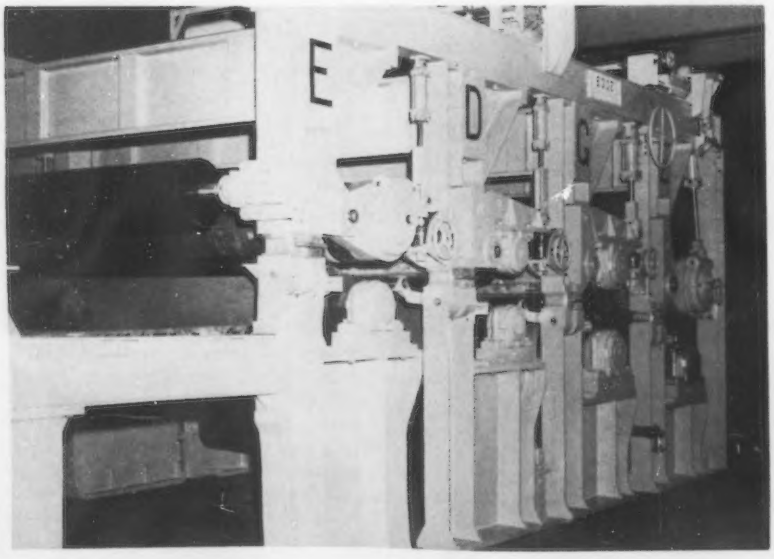
New Mill Marks Dierks' Entry Into Insulating Board Field

The mill features a specially designed fourdrinier wet end which allows the headbox and breast roll to be precisely raised or lowered. It is said to permit production of a wide range of board thicknesses.



Wet end of new machine before installation of 114 inch wide wire. Fourdrinier section is designed for adjustable pitch.

Press section has slight downgrade pitch. First and fourth presses have suction top rolls.



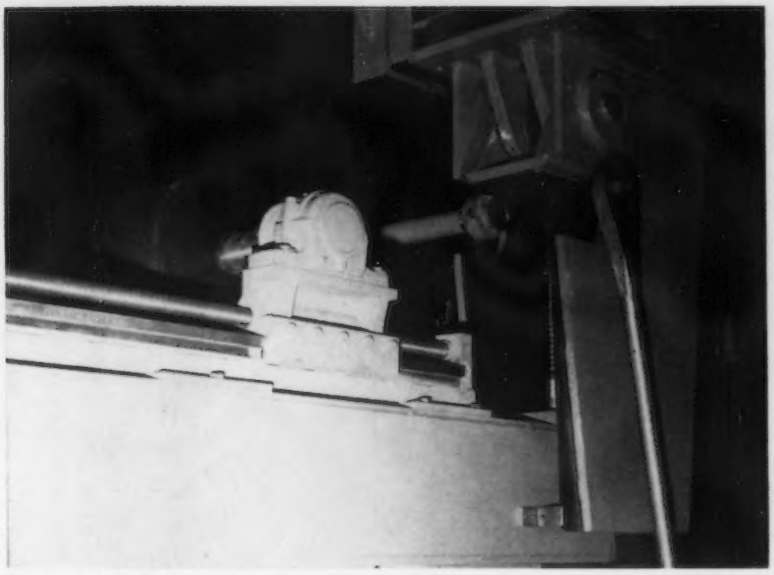
An important new insulating board machine, incorporating several significant design innovations, was brought into production recently by Dierks Forest, Inc., at its new mill in Broken Bow, Okla. Planned and constructed to produce a new type, high-quality wallboard called "Unifibre," the new "Choctaw Chief" was designed by Edge Wallboard Machinery Co. of Downingtown, Pa., and built by Layton-Greenfield, Inc., Coatesville, Pa. The machine is part of a major mill program which also included the installation of Bauer Brothers stock preparation equipment, a Moore 480-foot gas-fired kiln dryer, extensive power facilities, and General Electric synchronized drives. The mill is laid out to provide for the addition of another machine at a later date, which is intended for the manufacture of related wallboard products.

Use Kiln Dried Chips

The completely new mill at Broken Bow marks Dierks' entry into the insulating board field. It fits well into Dierks' many other far-flung operations which include pine and hardwood saw mills, a kraft paper board mill, a hardwood flooring plant, pole treating plants—all strategically located throughout Dierks' extensive timberland holdings in Arkansas and Oklahoma.

Only kiln dried pine chips, shipped in from the company's mills in Dierks, Arkansas and Wright City, Okla., are used in producing an excellent, uniform fiber which gives the new product its name. Chips are pulped in a Bauer M & D digester, chip breaker, refiners and tickler refiners. The pulp then is passed through a Clark & Vicario Deculator and onto the specially designed Edge fourdrinier and press.

The new Edge/Layton-Greenfield board machine—the "Choctaw Chief"—has a wire width of 114 inches and an ultimate capacity of 400,000 sq.



Jacks and stretchers below fourdrinier rails allow breast roll and headbox to be raised or lowered for optimum flow.

ft. per day. It is of the very latest design and incorporates a number of "firsts" including . . . adjustable pitch forming table, inclined presses and streamlined suction rolls.

Headbox and Breast Roll Can Be Raised or Lowered

One design element that is particularly significant is the use of jacks and stretchers below the fourdrinier rail, allowing the breast roll end and head box to be precisely raised and lowered to provide optimum flow, with no other adjustments necessary. Important in this control operation is the uniform ribbon-type flow of the stock up to 12 inches deep, at exactly the same speed as the moving wire.

Another interesting feature of the new machine is the streamlined design of the top suction rolls, which are made of centrifugally cast bronze shells, spirally drilled. The rolls are designed so that they may be easily swung out of the way to facilitate wire changes. In addition, a slight downgrade pitch is maintained for better operation.

The press arrangement is unusual, with four pairs of press rolls mounted on separate frame sections. Hydraulically loaded upper rolls are cantilevered to allow the use of an endless top wire. Top first press roll and top fourth press roll are suction rolls designed by Edge Wallboard Machinery Co. and built by Layton-Greenfield, for this specific application. The four-gear drive train which drives the press rolls uses cut-back guards only at mesh points to provide easier access for maintenance.

A 21-foot forming length is provided. Controls are arranged to permit production of a wide range of wallboard thicknesses on the same machine.

Other features of the "Choctaw Chief" include the extensive use of stainless steel parts throughout the construction for longer life. Multiple valve feed to the head box assures uniformity of feed across the machine.

Board is Light in Color

The Dierks' system for preparing raw materials used in making wallboard results in strong board, which is light in color and, therefore, particularly suitable for interior use where natural finishes or pastel painted surfaces are desired. Other production aims for the new facility center around an extended line of board products.

The Edge machine is said to be capable of making a wider range of board products than any other standard commercial units. Start-up of the new machine was accomplished with a minimum of diffculty as a result of the fine engineering of the Dierks' staff—headed up by Roy Murphy. One of Dierks' insulating board men with wide experience was quoted as saying: "The start-up of this machine was the smoothest I've ever seen, and as a result, saleable board was produced on the first production run."

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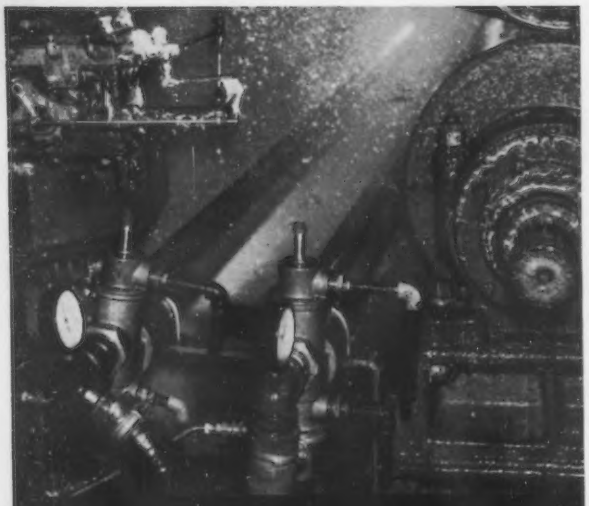
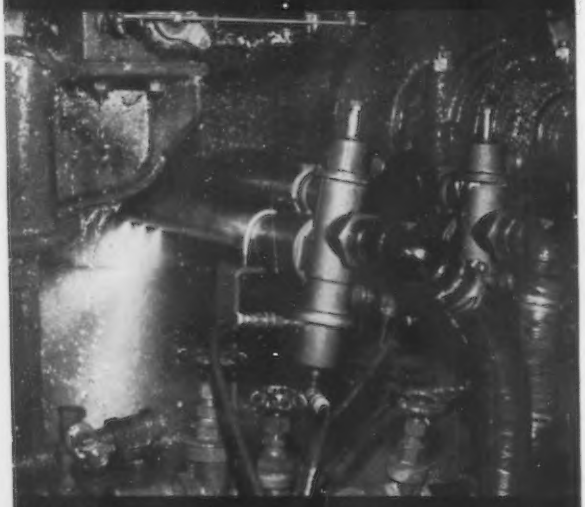
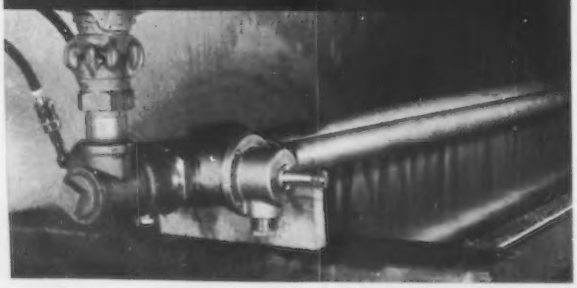


Above and below—
Typical installation of two showers.



Below—
Shower operating on testing tank.
Note simplicity of hook up.



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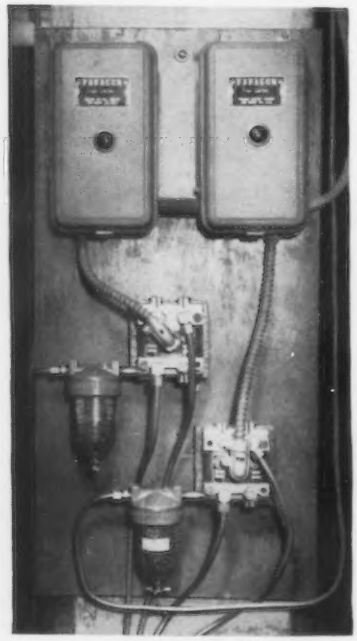

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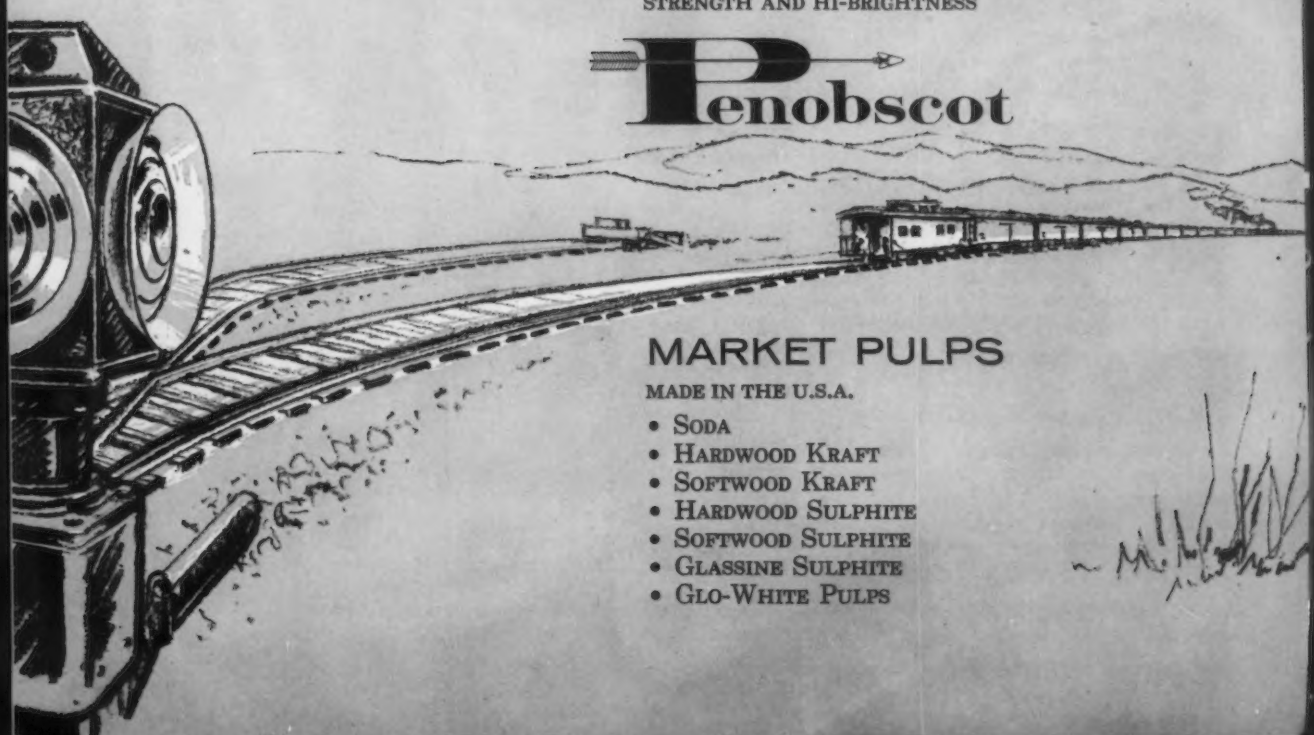

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PJT NEWS OF SUPPLIERS

H. B. Nielsen

F. J. Maywell

Nichols Engineering & Research Corp. appointed H. Bach Nielsen, general sales manager of the firm. A 1941 graduate of O.M.T., Denmark, Mr. Nielsen joined the firm in 1950 and served as head of the Spray Dryer Division, assistant vice president and assistant to the general manager.

Fleetwood Chemical Co. has appointed Frank J. Maywell, who has been covering Southern New England and the Middle Atlantic States for the company, head of Technical Sales Service.

Mr. Maywell, who has a long career with paper mills, was superintendent of the Morgan Paper Co. in Lititz, Pa., from December 1945 through 1954. For the two succeeding years, he served as consultant to the paper industry before joining the Gould Paper Co. in Lyons Falls, N. Y., as superintendent. In 1959 he left Gould to join Fleetwood.

A graduate of Drexel Institute, Mr. Maywell resides in Longmeadow, Mass.

Fischer & Porter Co., Warminster, Pa., manufacturer of industrial process control instruments and laboratory equipment, has named Lawrence R. Greenhaus vice president, marketing, and a director.

Mr. Greenhaus joined the Fischer & Porter organization in 1960 as general sales manager. He was formerly sales manager of the Luria Engineering Co., New York, and on the technical staff of Humble Oil & Refining Co. He received his B.S. and M.S. degrees in chemical engineering from the Carnegie Institute of Technology

Freeport Sulphur Co. has elected Peter Black and Arthur W. Gilbart vice presidents, and Wilmer H. Kingsford an assistant vice president.

Mr. Black has been president of Sulphur Export Corp. since 1958 when it was organized by Freeport and other U.S. sulphur producers to handle overseas sales. He joined Freeport in 1953 as assistant to the president and was named manager of export sales in 1955. Following graduation from Harvard and service in the Navy, Mr. Black was assistant to the director of the Office of Defense Mobilization.

Mr. Gilbart was employed by Freeport as assistant to the president in 1957 and was named assistant to the chairman of the board in 1958. A graduate of the Massachusetts Institute of Technology and the Harvard Business School, Mr. Gilbert was formerly a vice president of the Equitable Life Assurance Society.

Mr. Kingsford, a graduate of Princeton University, was named assistant to the chairman of the board in January of this year. Before joining the company in 1957 as a financial analyst, he was with the Fiduciary Trust Co. of New York.

M. H. Schneider

R. W. Phelps

Marbon Chemical Division of Borg-Warner Corp. has named Martin H. Schneider technical sales representative for a 21 central state area with headquarters in Chicago.

Prior to his new position, Mr. Schneider was a sales assistant at Marbon's Woodmar plant in Parkersburg, W. Va. Before that, he was associated with Ryerson Steel Co. and the Gulf Oil Corp. He is a graduate of the University of Pittsburgh.

Black-Clawson has appointed Richard W. Phelps a vice president of the company. Mr. Phelps will continue his responsibilities as general manager of the Dilts Division, Fulton, N. Y., manufacturer of the Black-Clawson line of paper and paperboard coating and converting equipment and plastic extrusion machinery.

Mr. Phelps joined Black-Clawson in 1949. He served the Dilts Division for five years as chief engineer and then as manager of engineering and product development before being named general manager in 1959.

Mr. Phelps' service with the Dilts Division has been during a period of wide expansion of the division's product line to serve the coating and plastic processing requirements of the paper industry and allied converting fields.

Hodgson Equipment Co., Tulsa, Okla., has been appointed sales representative for Cleveland Tramrail overhead materials handling equipment covering the state of Oklahoma and northwest Arkansas.

H. A. Hodgson, manager, mechanical engineering, has been engaged in material handling for 15 years. He is a native of Tulsa and a graduate of Oklahoma State University.

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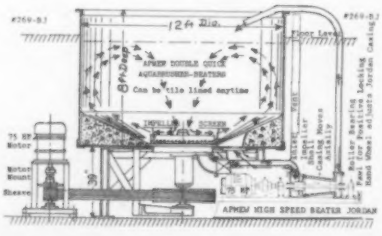

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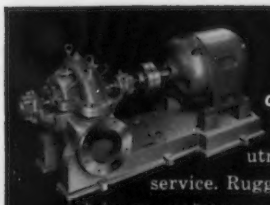

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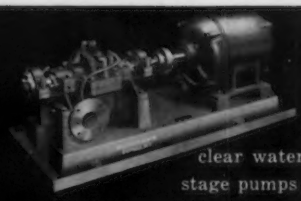

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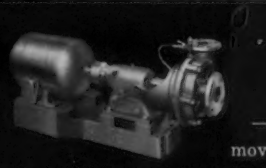
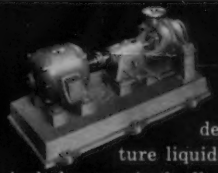
NEW! 'Buffalo' Hermetic Pumps—Quality pumps with special bearings for use where leakage would be dangerous or costly. Available in a broad range of materials of construction. Write for full details.

Non-Clogging Pumps—Move high consistency liquids dependably and efficiently. Minimize wear and wedging. Inspection simplified by diagonally split shell. Rubber-lined models for moving abrasive or corrosive liquids. Send for Bulletin 953.



Chemical Liquid Pumps—Specially designed for moving most corrosive abrasive or high consistency liquids. Your choice of many types in a variety of trim. Will withstand punishing conditions. Write for Bulletin 976.

GPL*



Heat Transfer Pumps—These special 'Buffalo' Pumps are designed to handle high temperature liquids. Job-engineered construction includes required alloys, water-cooled bearings and proper packings. Single suction, solid shell design gives peak efficiency. Write for complete details.

* True long-range pump economy depends on GPL (Gallons Per Lifetime)...pumped day-in-and-day-out with a minimum of down-time and maintenance costs. This is the kind of long-lived reliability built into every 'Buffalo' Pump. It is the most important result of top quality design and construction.

'Buffalo' offers a complete line of centrifugal pumps featuring parts interchangeability and low maintenance. Whatever your liquid moving needs, chances are there's a 'Buffalo' Pump to fit it perfectly. And your 'Buffalo' resident engineer is the man to recommend it. Contact him, or write us direct.

"Buffalo" PUMPS

BUFFALO PUMPS DIVISION

BUFFALO FORGE COMPANY

Buffalo, New York

Canada Pumps Ltd., Kitchener, Ontario

'Buffalo' Air Handling Equipment to move, heat, cool, dehumidify and clean air and other gases.

'Buffalo' Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.

'Buffalo' Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.

Squier Machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.

Prices of Fibers

MARKET WOOD PULP

FOURTH QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	$90.00/ —	$90.00/ —	$90.00/ —
Bleached Gw'd.	97.50/100.00	97.50/100.00			
Kraft, Blchd.	‡140.00/150.00	‡140.00/150.00	150.00/ —	150.00/ —	150.00/ —
Kraft, Blchd. Hdwd.	135.00/140.00		140.00/ —		
Kraft, Semi-bleached.	130.00/140.00				
Kraft, Unbl.	117.50/125.00	125.00/ —	125.00/130.00	125.00/ —	
Sulphite, Blchd.	‡135.00/140.00	‡135.00/140.00	140.00/ —	140.00/ —	140.00/ —
Sulphite, Bl. Hdwd.	135.00/ —				
Sulphite, Unblchd.	125.00/ —	125.00/ —	125.00/ —	125.00/ —	125.00/ —
Sulphite, Unb'l. Gl'an.		140.00/ —	134.00/ —		
Soda, Blchd.	130.00/135.00	130.00/135.00			

‡ Depending on Brightness.

COTTON LINTERS

F.O.B. OIL MILLS PER CWT
WEEK ENDED OCTOBER 17

	Atlanta	Memphis	Dallas	Los Angeles
Grade 1	n.a.	n.a.	n.a.	n.a.
2	$8.00/7.75	n.a.	n.a.	$7.50/ —
3	7.75/6.75	$8.25/7.25	$7.50/7.00	7.00/6.75
4	6.75/6.25	7.00/6.75	6.50/6.25	6.50/6.00
5	6.25/5.75	6.50/6.25	6.00/5.50	5.50/5.25
6	5.75/5.25	6.00/5.75	5.25/5.00	5.00/4.75
7	5.25/4.25	5.25/5.00	4.75/4.00	n.a.

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	October 23	October 23	October	October
No. 1 Mixed Paper	$ 14.00/ 15.00	7.00/ 10.00	6.00/ —	12.00/ —
No. 1 News	21.00/ 24.00	11.00/ 14.00	18.00/ —	16.00/ —
Overissue News (Lg. size)	21.00/ 24.00	12.00/ 14.00	23.00/ —	18.00/ —
Mill Wrappers	19.00/ 22.00	10.00/ 12.00	11.00/ —	13.00/ —
Old Corrugated Containers	22.00/ 25.00	18.00/ 18.50	22.00/ —	16.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	33.00/ —	50.00/ —
New Double Kr. Ld. Corr. Cuts	30.00/ 32.50	30.00/ 32.50	35.00/ —	27.50/ —
(Semi-chem. medium)	45.00/ —	40.00/ 45.00	42.50/ —	— / —
New 100% Kraft Corr. Cuts	42.50/ 47.50	— / —	52.50/ —	— / —
New Br. Kraft, Env. Cuts	65.00/ 70.00	65.00/ 75.00	47.50/ —	37.50/ 40.00
New Br. Kr. Bag Waste Prntd.	50.00/ 55.00	50.00/ 60.00	47.50/ —	35.00/ —
New Br. Kr. Bag Waste Unprintd.	55.00/ 60.00	60.00/ 65.00	55.00/ —	45.00/ 47.50
No. 1 Groundwood Shvs.	30.00/ 35.00	20.00/ 25.00	17.00/ —	25.00/ —
White Newsblanks	50.00/ 55.00	40.00/ 45.00	30.00/ —	55.00/ —
No. 1 Soft White Shvs.	60.00/ 65.00	55.00/ 65.00	50.00/ —	75.00/ —
Super Soft White Shvs.	65.00/ 75.00	70.00/ 80.00	60.00/ —	— / —
Hd. White Shvs.	85.00/ 90.00	80.00/ 90.00	75.00/ —	80.00/ —
Hd. White Env. Cuts	95.00/100.00	100.00/105.00	80.00/ —	103.00/ —
Col. Tab. Cards	50.00/ 62.50	54.50/ 59.50	47.50/ —	35.00/ —
Manila Tab. Cards	72.50/ 77.50	67.50/ 72.50	70.00/ —	75.00/ —
No. 1 Col. Ledger	35.00/ 40.00	32.50/ 35.00	42.50/ —	23.00/ —
White Ledger	55.00/ 57.50	50.00/ 55.00	50.00/ —	40.00/ 45.00
Mixed Book & Mag.†	14.00/ 15.00	— / —	10.50/ —	/ —
No. 1 Books‡	15.00/ 20.00	18.00/ 22.00	27.50/ —	8.00/ 13.00

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

OBITUARIES

Thomas F. Donoghue, 66, retired sales executive of Riegel Paper Corp., died at Katonah, N. Y., on September 19. Mr. Donoghue retired from Riegel on January 1, 1961 after more than 48 continuous years with the company.

Theodore W. Dunn, 89, chairman of the board and treasurer of the Dunn Paper Co., of Port Huron, Mich., died October 18 at Port Huron General Hospital.

Mr. Dunn founded the company in 1924. For many years before that he was general manager of the Detroit Sulphite Pulp and Paper Co., now a division of Scott Paper Co.

Herbert A. Kidd, 66, vice president and general manager of the Georgia Kraft Co. at Macon and Rome, Ga., died October 15, in Atlanta. Mr. Kidd, born and educated in Scotland, came to the United States in 1929 and joined The Mead Corp. of Dayton, Ohio, the same year. His 31-year career with Mead included many important assignments in paperboard research, mill management, and construction supervision. In 1951 he was elected a vice president.

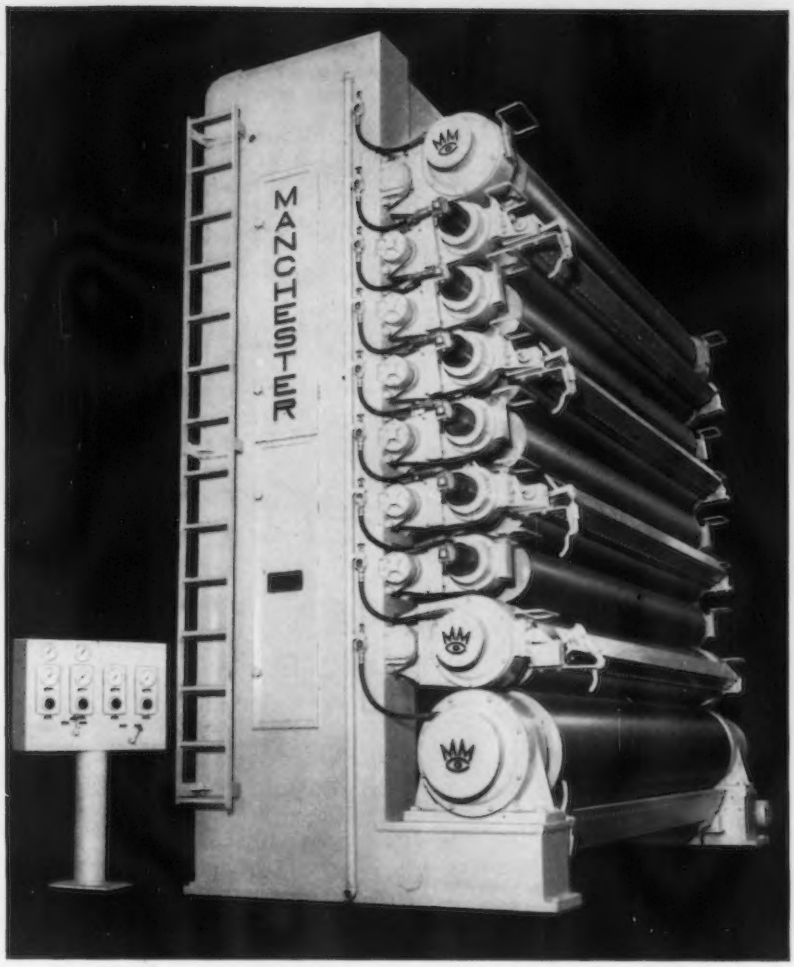
Upon retirement as a Mead officer in April, 1960. Mr. Kidd continued as operating head for Georgia Kraft.

Abraham Lewenstein, 60, vice president and technical director of the Appleton Coated Paper Co., died October 21 of a heart attack. Mr. Lewenstein was known for development of a system for coating paper as it came off the machines.

James C. Kimberly, 90, father of John R. Kimberly, chairman of the board of Kimberly-Clark Corp., died October 17 at his home in Neenah, Wis.

He was the son of one of the founders of Kimberly-Clark, and was a vice president and director prior to his retirement in 1945 after 54 years of association with the company. He had also served as director, president and board chairman of the former Neenah Paper Co.

Ben Marks, president of the Massillon Paper Co. and the Marks Waste Material Co., Canton, Ohio, died October 9 after an illness of six months.



Manchester gives you everything you want in a calender

New Manchester nine-roll, 147 inch face open side calender built for Champion Paper & Fibre Company, Hamilton, Ohio

Here is a truly *new* open side calender *with independent load control of any roll in the stack.* Now you can produce a smoother, more uniform finish on a wider range of fine papers. Another outstanding feature is Manchester's air-over-hydraulic loading system. It permits precise pressure adjustments for all rolls . . . gives you all the advantages of sturdy hydraulic loading . . . *yet uses only ordinary mill air pressure as a power source.* No hydraulic pumps, tanks or motor drives needed!

All loading, unloading and *nip relieving* is accomplished through levers within the rugged, all-steel calender frames. Every adjustment is under finger-tip control from a master console.

This new calender is another example of how Manchester builds profits for paper makers through *modern,* efficient design concepts. For the new equipment you're planning now, why don't you call in the Man from Manchester? **The Manchester Machine Company, Middletown, Ohio**

Manchester . . . profit builders for paper makers

THE MANCHESTER MACHINE COMPANY

ECONOMIC RESEARCH

Opening for fairly recent college graduate with analytic mind and the capability of formulating practical approaches to complex industrial problems—involving cost analysis, market analysis, and forecasting. Degree in industrial engineering, economics, mathematics or industrial management required.

Write for all details and brochure to L. G. Hill, Battelle or call AX 9-3191, Ext. 2432 for appointment.

BATTELLE
MEMORIAL INSTITUTE
505 King Avenue
Columbus 1, Ohio

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures
(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Sept. 16	Sept. 23	Sept. 30	Oct. 7	Oct. 14
1961	94.4r	93.1	94.7r	92.3r	93.8
	Sept. 17	Sept. 24	Oct. 1	Oct. 8	Oct. 15
1960	93.2	93.7	95.5	93.6	95.3

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	96.5	97.7	98.1	96.9	97.6	96.1	81.2	91.7	89.1	94.8	92.0	80.2	92.7
1961	87.9	90.0	91.2	91.2	91.6	91.3	78.0	90.5	88.0‡				

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1954	1955	1956	1957	1958	1959	1960	1961
Year to Date	91.6	95.8	98.4	91.1	86.6	92.4	93.9	89.1
Year Average	91.6	96.2	97.9	90.4	87.0	92.0	92.7	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	Sept. 16	Sept. 23	Sept. 30	Oct. 7	Oct. 14
1961	98	97	98	97	98
	Sept. 17	Sept. 24	Oct. 1	Oct. 8	Oct. 15
1960	93	93	93	92	94

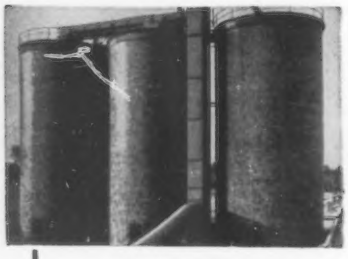
COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	92	95	94	93	94	92	78	94	88	93	86	73	89
1961	89	89	92	91	92	95	78	95	92				

† *Per cents of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	WEEK ENDING October 7, 1961	WEEK ENDING October 14, 1961	CUMULATIVE TO DATE January 1, 1961 to October 14, 1961
% Activity	97%	98%	91%
Total	349,930	349,905	12,955,639
Containerboard—Domestic Use	189,321	180,668	6,639,592
Liner	128,716	119,397	4,422,348
Corrugating Material	55,317	57,157	2,019,213
Chip & Filler Board	5,288	4,114	198,031
Boxboard—Domestic Use	96,632	100,072	3,922,724
Folding	60,549	63,190	2,341,956
Set-Up	10,667	11,005	381,978
Special Food Board	25,416	25,877	1,198,790
Other Paperboard	63,977	69,165	2,393,323
Containerboard Type	30,258	35,143	1,152,173
Boxboard Type	33,719	34,022	1,241,150
Total Orders			
Received	382,118	332,644	
Unfilled End of Week	598,031	580,881	



We Design, Erect and Maintain All Types of Tile Structures and Corrosion-Resistant Linings

STEBBINS
ENGINEERING AND MANUFACTURING CO.
WATERTOWN, N. Y.
Pensacola, Seattle,
Montreal, Vancouver

CHAS. T. MAIN, INC.
ENGINEERS
PROCESS STUDIES, DESIGN, SPECIFICATIONS, CONSTRUCTION SUPERVISION
PULP AND PAPER MILLS
STEAM, HYDRAULIC AND ELECTRICAL ENGINEERING
REPORTS, CONSULTATION, VALUATIONS
●
BOSTON, MASSACHUSETTS
CHARLOTTE, NORTH CAROLINA

Stadler Hurter
International Ltd.
Engineers • Designers • Consultants
Specializing since 1923 in all phases of design, modernization and expansion of pulp and paper mills from forest to finished product.
1501 ST. CATHERINE ST. W.
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PARIS • ZURICH

AMERICAN AND ENGLISH CLAYS

FOR ALL PAPER MAKING PURPOSES

ANGLO-AMERICAN CLAYS CORP.

(Formerly: English China Clays Sales Corporation)

6 East 45th Street, New York 17, N. Y.

Concrete Gravity Air-Water-Wash type water Filtration Plant producing, at low cost, water with turbidity O, color under 5 and iron 0.05 p.p.m. Fe.

OTHER PRODUCTS

Demineralizing Plants
Water Softening Plants
Pressure Filter Plants

and

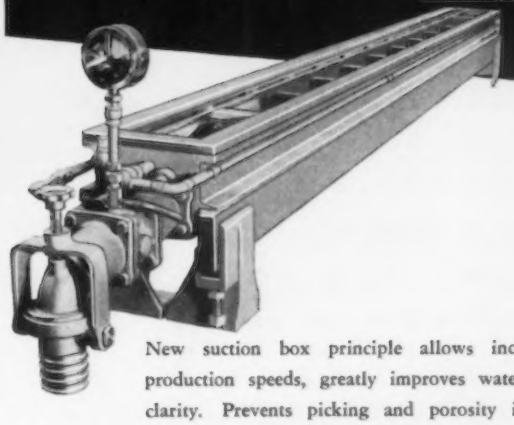
All other types of water treating systems, including strainer valves, air wash systems, filter sand and anthracite beds and all filter repair and replacement parts. Over 50 years experience building new and modernizing old water treatment plants.

Write for FREE Bulletins

HUNGERFORD & TERRY, INC.

CLAYTON 4, NEW JERSEY

New Dandy Roll Suction Box Makes Good Watermarks BETTER



New suction box principle allows increased production speeds, greatly improves watermark clarity. Prevents picking and porosity in the making of thin and superfine papers. Better quality and finish assured. Write for descriptive literature.

THE SINCLAIR COMPANY

61 APPLETON STREET • JEfferson 2-9488

HOLYOKE, MASSACHUSETTS

RECORD PAPER & PULP STOCK VALVES "BONNETLESS" SELF CLEARING - - - "RESIDUE POCKETLESS TYPE"

METALS — I.B.B.M. all iron, bronze or stainless steels, body parts plain or rubber lined.

The photo of 24" Fig. 241 I. B. B. M. valve while illustrating the gate bottom wedge system for forced gate seating and "GUILLOTINE" edge for shearing fibre at seat also shows the packing box and yoke as separate units. Both adjustable.

• The "FAST THREADED" screw stem and ball bearing speeds valve operation.
• The packing box is extra deep, is adjustable and provided with specialized lubricated packings and special type gland and compression bolts.
• The yoke mountings are such that yokes for various methods of gate operation are interchangeable.
• Replaceable gate edge shoes are used in valves 10" and larger. These shoes are of special value when valves are installed stem and pipe horizontal.

"RECORD PRODUCTS EXTENSIVELY USED IN DEFENSE PROJECTS"

RECORD FOUNDRY & MACHINE COMPANY

LIVERMORE FALLS, MAINE, U. S. A.

PAPER TRADE JOURNAL

CLASSIFIED ADVERTISING RATES

HELP WANTED—$1.50 (6 words to line). Minimum charge $5.00.
SITUATIONS WANTED—$1.50. Minimum charge $5.00. If repeated ½ rate will be charged for each consecutive repetition.
FOR SALE—$1.50 a line. Minimum charge $5.00.
WANTED—$1.50 a line. Minimum charge $5.00.
OPPORTUNITIES—$1.50 a line. Minimum charge $5.00.

Classified Advertising is non commissionable.

Classified advertising space may also be purchased at $8.00 per single column inch. All classified advertisements are payable in advance.

If box number is used—75 cents additional.

Address replies to advertisements appearing under Box Number in care of PAPER TRADE JOURNAL, 49 West 45th Street, New York 19, N. Y.

Help Wanted

PAPER MEN

$5,000 to $50,000

SALES • PRODUCTION • TECHNICAL

Finding and landing THE ONE BEST JOB requires sound analysis, careful planning, proper contacts and skillful negotiation.

Paper men ourselves, and the only recognized professional specialists in the world in our particular field, we assist responsible paper men to accelerate their careers by uncovering and developing THE SPECIFIC SITUATION that most exactly fits the needs of each individual we serve.

If you seek to better yourself, and your performance to date entitles you to our endorsement, we can and will help you. Contact us in absolute confidence for information regarding procedure.

GEO. M. SUNDAY & ASSO.

PERSONNEL CONSULTANTS TO THE PULP, PAPER & ALLIED INDUSTRIES

6 East Monroe, Chicago ANdover 3-1970

TF

Leading paper mill and paper converter **has excellent opportunity for man with training and experience in modern methods of quality control. Starting salary open, up to $15,000, plus fringe benefits and good working conditions. Location in the Southeast, town of 12,000 population. All replies will be kept confidential. Send complete resume, including education, experience, present earnings, to Box 61-203, care Paper Trade Journal.**

D-4

CONTROL ENGINEER

A growing, aggressive paper company located in Maine has openings for two men with 2-5 years' experience. Excellent starting salary and benefits. Unusual opportunities to move ahead with an expanding concern. Send resume to P.O. Box 635, Bangor, Maine.

N-6

Wanted
TOUR BOSS

For boxboard mill with experience in setup and folding grades. Give complete resume stating experience, education and references. Replies treated confidentially. Address Box 61-213 care Paper Trade Journal.

N-6

WANTED

PAPER MILL SUPERINTENDENT AND TOUR BOSS:

For newsprint mill outside U.S.A.—Must be well experienced and capable of training men.—Must be willing to work long—hard hours for good salary.—Reply with full resume, giving references and marital status and number of children to Box 61-195 Paper Trade Journal, 49 West 45th St., New York 36, N. Y.

O-30

CHIEF CHEMIST

Excellent opportunity for chemist with paper mill experience.

Progressive midwest paper manufacturer prefers man with a B.S. degree in chemistry and a background in the manufacture of colored papers.

This position offers you great opportunity to advance your career with an expanding company. Liberal benefit plan. Your reply will be held in the strictest confidence. Send a complete resumé and salary requirements to:

BOX 61-212 CARE PAPER TRADE JOURNAL

O-30

PULP AND PAPER ENGINEERS

Graduate engineers experienced in operations and maintenance for growth positions in an expanding pulp and paper mill located in Western Maryland. Salary commensurate with contribution and excellent opportunity for advancement. Send detailed resume of experience and education in confidence to:

Industrial Relations Manager
West Virginia Pulp and Paper
Fine Papers Division
Luke, Maryland

TF

CHEMICAL ENGINEERS

Our Technical Department is looking for Chemical Engineers to do project engineering in process development. We prefer a minimum of five years experience, not necessarily confined to our type operation. These are good opportunities with a steadily growing company. Salary commensurate with experience and ability.

Our plant is located in Southeastern North Carolina near several beaches and other recreational facilities.

Write in full to

Personnel Department, Riegel Paper Corporation
Pulp & Paperboard Division, Acme, North Carolina

N-6

ROSS PAPER MACHINERY CO.

265 PASSAIC STREET • NEWARK 4, NEW JERSEY

STANLEY S. ROSS, President — HUMBOLDT 4-8880

QUALITY GUARANTEED MACHINERY FOR SALE OR LEASE

BACK STANDS—FOR ROTARY SHEETERS
2—Stevens 10 roll (5 running—5 loading) for 46″ max. roll dia. Complete including elec. hoist for lower rolls. New 1959.

BEATERS
2—3000# Downingtown 60″ x 67″ roll; like new
2—700# Valley, roll 48″ dia. x 38″ face, tile lined, 50 h.p. motors

CALENDER STACKS
1— 80″ P & J 7 roll; heavy duty
2— 82″ & 86″ Lobdell five roll
1—104″ B-C 8 roll
1—115″ B-C 7 roll
1—124″ Downingtown 5 roll
1—124″ Downingtown 6 roll
1—160″ Lobdell—8 Roll; Hydraulic Loading; motor operated

CENTRIFUGAL SCREENS
3—24″ Shartle Selectifiers, non-contacting type scrapers, monel baskets, air operated valves.

CHIPPERS
1— 96″ Murray 6 knife; A-F Brng.

COATERS
1— 24″ Waldron Coater & Embosser
1— 60″ Egan Air Knife—New 1956
2— 65″ & 76″ Mayers

COMPLETE PAPER & BOARD MACHINES
3—Sandy Hill 81″ trim single cyl. Tissue
1—B-C 100″ 7 cyl. Board Machine Complete
1—Rice Barton 84″ Fourdrinier

CYLINDER MOLDS
1—104″ face x 36″ dia.
6—114″ face x 36″ dia. w/rubber couches
8—124″ face x 36″ dia. w/rubber couches

CYLINDER WET ENDS
1—Single cylinder; 99″ face x 48″ dia.
1—114″ 7 cyl. Wet End, complete
1—124″ 7 cyl. Wet End, complete

DRIVES—ENCLOSED RIGHT ANGLE
17—25-75 h.p.—complete with clutches & cone pulleys
38—1 h.p.-125 h.p. parallel gear boxes

DRYERS—HYDROSTATICALLY TESTED

24″ Dia.:
36— 46″ face; Chrome plated
1—156″ face w/gear and steam joint

28″ Dia.:
3— 70″ face w/gears & bearings
3— 73″ face w/gears & bearings
6— 76″ face w/gears & bearings
4— 84″ face w/accessories

36″ Dia.:
1— 42″ face
2— 44″ face; 2—46″ face
3— 70″ face w/gears & bearings
11— 72″ face w/gears & bearings
1— 74″ face Lukenweld w/A-F Brng.
8— 75″ face w/gears & bearings
26— 76″ face; complete section
9— 76″ face w/gears & bearings
2— 77″ face w/gears & bearings
1— 78″ face w/gears & bearings
2— 80″ face
5— 84″ face
9— 84″ face; complete section
7— 92″ face; complete section
1— 96″ face
1—138″ face
10—160″ face

42″ Dia.:
23— 73; 74; 76″ face; complete section
24— 96″ face w/gears, frames & bearings
1—120″ face
1—160″ face

48″ Dia.:
15— 46″ face; nickel plated
12— 82″ face; complete section
3— 84″ face
7— 94″ face
1— 96″ face
12— 98″ face—complete section
19—106″ face w/gears & bearings
6—110″ face w/gears & bearings
10—123″ face w/gears, frames & bearings
1—128″ face
22—164″ face w/gears & bearings

EMBOSSERS
1— 80″ Hudson Sharp; A-F Brng.
2— 62″ Textile Machinery Co., w/drives

EXTRACTORS ROLLS—DOWNINGTOWN
1—128″ face x 24″ dia.—complete section

FELT CONDITIONERS—VICKERY
1—New Bird—218″ Max. cleaning area

FLAT SCREENS
1— 12 plate IMPCO w/Dunbar Drives
8— 14 plate IMPCO—Bronze Vats S.S. Plates
294 S.S. plates—.014 cut to .020 cut

FOURDRINIER SECTIONS
1—Beloit Yankee Fourdrinier section—wire 132″ x 47 ft. 4″. Oper. 870 f.p.m. 132″ x 10 ft. Yankee Dryer also available.

INLETS & HEADBOXES
1—131″ Valley w/10″ distributing roll; SS lined

JORDANS
1—Horne w/A-F Brngs.
1—Shartle Miami #2 w/A-F Brngs.
1—E. D. Jones #4 Imperial A.F. Brng.

LAYBOYS
1—Hamblet 124″—gear motor operated
1—Hamblet 88″—gear motor operated
1—Beck 65″ w/auto lowering device

MOTORS 3 PH 60 CYCLE
1—100 h.p. GE; 440 v; 695 r.p.m.
1—300 h.p. West; 2200 v; 503 r.p.m.
1—350 h.p. GE; 2200 v; 720 r.p.m.; Synch.

PAPER MACHINE DRIVES
1—De Laval 100 h.p. steam turbine w/reducers

PULPER
1—Wells 16 ft. Steel Tub w/motor, junk box and Cent. Pump & motor

PULP MILL EQUIPMENT
1—Lannoye #1 Pulper
1—Murray 2 deck Chip Screen, 5 ft. x 14 ft.

PUMPS—OPEN IMPELLER
47—Centrifugal Stock and Water Pumps
1—Shartle 8 x 18 Duplex

REELS
1—100″ Kohler automatic two arm unwind reel; 60″ dia. rolls; new condition
1—109″ two bowl upright
1—123″ Beloit—2 bowl
1—126″ Beloit Aldrich surface drive type
1—146″ B & S pope type w/Reliance drive

REFINERS
2—#1 Claffin; A-F Brng.
3—#6 Morden Stock Makers—Model HA
1—24″ Downingtown Weiner; new
2—36″ Bauer, Model 185 w/2—75 h.p. motors
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1—36″ Bauer, Model 185 with two 100 h.p. motors— SS Construction
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17¾″ Maximum Rewind Diameter
1— 26″ Cameron Type 24
2— 42 Cameron Type 26-2A

24″ Maximum Rewind Diameter
2— 42″ Cameron Type 6
1— 42″ Cameron Type 6 Shear Cut
2— 62″ Cameron Type 6

30″ Maximum Rewind Diameter
1— 52″ Cameron Type 10; A-F Brng.

36″ Maximum Rewind Diameter
1— 82″ Cameron—Model 10-10

42″ Maximum Rewind Diameter
1— 82″ Johnstone, Model 16; A-F Brng.
1—136″ Cameron Type 18; A-F Brng.
1—161″ Cameron Type 18 w/60 h.p. Reliance VS Drive

48″ Maximum Rewind Diameter
1— 86″ M & W Four Drum Shear Cut
1—152″ Langston Shear Cut

60″ Maximum Rewind Diameter
1— 90″ Langston Shear Cut; A-F Brng.
1—112″ Cameron Type 18
1—120″ M & W two drum w/75 h.p. drive
1—120″ Langston
1—136″ Langston; AF Brng; shear cut

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300 to 400 H.P., for beating. Simple flow and filling changes convert this machine to the Morden Stuff-Maker Jordan.

MORDEN STUFF-MAKER JORDAN

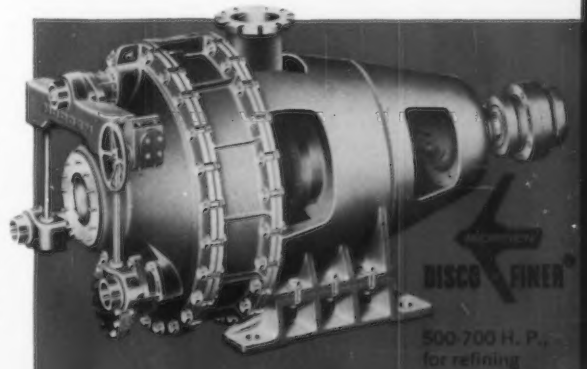
The Morden Stuff-Maker for jordaning represents a real technical advance in Jordan engines. In place of conventional rolled bar fillings, Morden provides precision cast, dynamically balanced fillings which require no grinding in. Technically advanced Morden fillings substantially improve treatment, give service far in excess of conventional rolled bar fillings. **Complete information supplied upon request.**

better stock treatment • lower power consumption • greater production

• MORDEN accomplishes all three

MORDEN DISCO-FINER, 500-700 H.P.

The most significant new development in stock preparation, the NEW MORDEN DISCO-FINER, provides (a) Tremendous capacity, (b) Low power consumption per ton of production. Simple flow and filling changes adapt the Disco-Finer for defibering or refining. The new self-aligning, semi-conical design of rotor and stator plates overcomes possibility of warpage or deflection. Here, truly, is the answer where large production and high precision treatment are required. **Complete information upon request.**



500-700 H. P., for refining and defibering.

MORDEN SLUSH-MAKER PULPER

CONTINUOUS OR BATCH OPERATION

Regardless of your pulping requirements, there just is no better answer than the Morden Slush-Maker Pulper. It can be employed on continuous or batch operation. Can be mounted beneath the paper machine to handle dry-end broke on a continuous basis at full machine production. Rapid circulation and the unique Morden brushing action give the most thorough repulping. Even where the job is toughest, where space is limited, the Morden Slush-Maker handles pulp sheets, paper stock, coated and uncoated brokes and completely defibers difficult wet-strength brokes. **Write for full story.**

SLUSH-MAKER PULPER
batch or continuous pulping.

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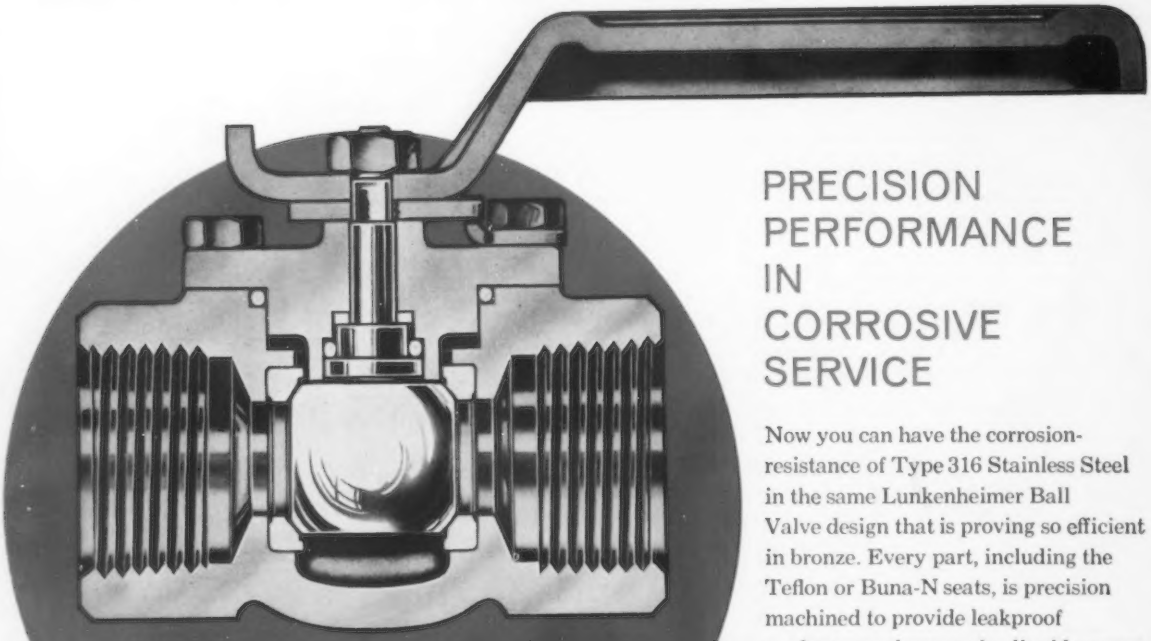
NEW LUNKENHEIMER STAINLESS STEEL BALL VALVE



Figs. 704-T and 704-B—TYPE 316 STAINLESS STEEL—SIZES ¼" to 2"
TEFLON OR BUNA-N SEATS AND SEALS

- TOP ENTRY FOR EASY IN-LINE MAINTENANCE
- QUARTER-TURN OPERATION
- SELF-ALIGNING BALL
- STRAIGHT-THROUGH FLOW
- COMPACT DESIGN
- LOW OPERATING TORQUE

PRECISION PERFORMANCE IN CORROSIVE SERVICE

Now you can have the corrosion-resistance of Type 316 Stainless Steel in the same Lunkenheimer Ball Valve design that is proving so efficient in bronze. Every part, including the Teflon or Buna-N seats, is precision machined to provide leakproof performance in corrosive liquids, gases, and slurries. Corrosive atmospheres are no threat to solid Stainless Steel bodies and bonnets. Recommended for both pressure and vacuum applications.

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THE ONE *Great* NAME IN VALVES
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